

# BOTANICAL ABSTRACTS

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FOR EDITORIAL AND BUSINESS NOTICES, SEE THIRD COVER PAGE



## CONTENTS

Agronomy.....	1026-1127
Bibliography, Biography and History.....	1128-1149
Botanical Education.....	1150-1176
Cytology.....	1177-1199
Ecology and Plant Geography.....	1200-1290
Forest Botany and Forestry.....	1291-1344
Genetics.....	1345-1498
Horticulture.....	1499-1531
Morphology, Anatomy and Histology of Vascular Plants.....	1532-1555
Morphology and Taxonomy of Algae.....	1556-1583
Morphology and Taxonomy of Bryophytes.....	1584-1588
Morphology and Taxonomy of Fungi, Lichens, Bacteria and Myxomycetes.....	1589-1637
Paleobotany and Evolutionary History.....	1638-1655
Pathology.....	1656-1782
Pharmaceutical Botany and Pharmacognosy.....	1783-1805
Physiology.....	1806-1974
Soil Science.....	1975-1997
Taxonomy of Vascular Plants.....	1998-2106
Miscellaneous, Unclassified Publications.....	2107-2115

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# BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC

J. R. SCHRAMM, Editor-in-Chief

FREDERICK V. RAND, Associate Editor-in-Chief

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FEBRUARY, 1925

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ENTRIES 1026-2115

## AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 1128, 1159, 1206, 1211, 2227, 1237, 1243, 1348, 1357, 1360, 1363, 1465, 1502, 1542, 1546, 1667, 1709, 1719, 1724, 1727, 1771, 1801, 1825, 1831, 1991, 1999, 2080, 2088)

1026. ANONYMOUS. **A British-made double crusher in Natal.** South African Sugar Jour. 8: 495. 1924.—A British-made pre-crusher for the Uba cane in Natal, installed at New Guelderland, is giving results "fully up to expectation." The machine and method of operating it are described. According to opinions of men experienced in cane crushing, the condition of the cane as it leaves this crusher is all that could be desired, and it is believed marked improvement will be found in its extraction efficiency and that there will be a consequent reduction in the number of tons of cane required to make a ton of sugar.—*Nellie E. Fealy.*

1027. ANONYMOUS. **Chinese Lucerne.** Jour. Dept. Agric. Union South Africa: 8: 623-625. 1924.—This is a short account of a variety which was introduced into the United States from Thibet, and which has been named "Chinese Lucerne" in South Africa. It appears to thrive well in the latter country where it has been under cultivation for several years. It is commended to the stock farmer as it is a heavy yielder and is remarkably resistant to frost, thus having a longer growing period than other cultivated varieties.—*L. I. Goldblatt.*

1028. ANONYMOUS. **Further statistics in connection with summer crops.** 1922-3. Rhodesia Agric. Jour. 21: 152-157. 1924.—These statistics give the production in Rhodesia of summer crops other than maize.—*L. I. Goldblatt.*

1029. ANONYMOUS. [Loss of sugar from topping cane previous to cutting.] South African Sugar Jour. 8: 525. 1924.—Recent experiments in the Philippines showed that loss of sugar from topping cane previous to cutting amounted after the first 24 hours to  $\frac{1}{8}$  of a picul (22½ pounds) per ton of cane, and to  $\frac{1}{3}$  of a picul (45 pounds) after 3 days. Cane cut and allowed to lie in the field showed a loss of  $\frac{1}{3}$  of a picul for each ton of cane after 24 hours, and  $\frac{2}{3}$  of a picul (90 pounds) after 4 days delay in loading after cutting.—*Nellie E. Fealy.*

1030. ANONYMOUS. **Natal Uba in Porto Rico.** South African Sugar Jour. 8: 469. 1924.—Uba is considered a good cane only for Natal and Zululand conditions. Many of the so-called Ubas growing in other parts of the world are entirely different from the Uba of Natal.—*Nellie E. Fealy.*



1031. ANONYMOUS. Prickly pear as fodder. Experiences in India. South African Sugar Jour. 8: 599. 1924.—“Prickly pear is a safe and useful supplementary fodder which should be used wherever it is available in a district where fodder scarcity prevails.” Cattle can be kept alive on prickly pear with a small amount of dry fodder. Directions are given for preparation of the fodder, quantity to be used, method of feeding, and on how to induce animals to become accustomed to the food. Suggestions are given for remedying intestinal trouble arising under certain conditions from the use of the pear fodder.—*Nellie E. Fealy*.

1032. ANONYMOUS. The much maligned Uba cane. Experience of some other countries. South African Sugar Jour. 8: 593, 595. 1924.—The Louisiana Planter's “scathing criticism” of Uba cane is given. Notwithstanding this criticism the author declares that the “much-maligned” Uba cane has been the salvation of the Natal sugar industry, that this is the judgment of many of its former enemies, and that it compares favorably with some of the best-known varieties.—*Nellie E. Fealy*.

1033. ANONYMOUS. The Natal Planters' Union. South African Sugar Jour. 8: 479. 1924.—The proposition of establishing a sugar experiment station with sub-stations was discussed at a meeting of the Natal Planters' Union. Among the reasons given for the necessity of establishing these stations was that of studying the streak disease of cane, which is proving very destructive. Other phases of the industry which should be studied are the relative merits of hand-thrashed and burnt cane, different methods of fertilization and cultivation, and different varieties for different soils.—*Nellie E. Fealy*.

1034. ANONYMOUS. The villagers' calendar 1924-25. xiv + 120 p., 2 fig. Govt. Press: Madras, 1924.—The activities of the Madras Agric. Dept. are indicated briefly with an account of the work done in the districts by way of agricultural improvement and propaganda. Notes appear on the cultivation of pineapples in parts of Malabar and the Nilgiris, of *Penisetum cenchroides* (kolukattai grass) a grass of considerable fodder value and on selection of seed coconuts for propagation, besides other notes relating to manures, implements, insect pests, cooperation, etc. The mycologist describes, and suggests remedial measures for, the fungous disease affecting limes and oranges, the ginger disease, cholam smut and mahali disease of arecanut (*Areca catechu*).—*P. S. Jivanna Rao*.

1035. ABRAJANO, QUIRICO F. Rice on cogon soil with and without treatment. Philippine Agric. 12: 181-188. 1923.—The addition of organic material supplying N improved the growth of rice (*Oryza sativa* L.) planted in soil previously occupied by cogon (*Imperata cylindrica* L.).—*Sam F. Trelease*.

1036. ANSTEAD, RUDOLPH D. Report on the operations of the Department of Agriculture, Madras Presidency, for the official year 1922-23. 30 p. (NOYCE, F. Development. [Government review.]) 4 p., 1 map. Government Press: Madras, 1924.—This report is based on the annual administrative reports (printed separately) of 27 officers subordinate to the Director of Agriculture, Madras, and reviews the work under the following heads: Administration, agricultural education, research and experiments, demonstration, agricultural engineering, publication and supply of information, statistics, miscellaneous accounts, and program of work for 1923-24. The sugar canes raised at Coimbatore have been successful in northern India, especially in the unirrigated areas of the Punjab. Work on paddy consisted in the study of the inheritance of characters and in raising and testing improved strains. The cotton specialist continued his work on Cambodia cotton (*Gossypium hirsutum*) and the F<sub>2</sub> generation of the Roseum-Indicum cross was under examination. In a study of the bud and boll shedding it was found that “if the boll worm population could be reduced during the 1st  $\frac{1}{2}$  of the season the percentage of damaged bolls would be reduced to a negligible quantity and at the same time the shedding would probably be reduced also.” The gardens in the Nilgiris were planted with more fruit trees and spices, and Jalap and Ipecacuanha show promise of profitable cultivation. The “pollu” disease of pepper (*Piper nigrum*), secondary leaf-fall in rubber (*Hevea brasiliensis*), the betel vine disease and the diseases of paddy and sugar cane were under investigation and the pest act was enforced in certain areas in respect to the insect pests affecting cotton and coconut and the fungous disease of the palmyra palm (*Borassus flabellifer*). Work on groundnut, coconut and potatoes was continued and selection work on cholam (*Andropogon sorghum*) started.—*P. S. Jivanna Rao*.



1037. BAKKE, A. L., AND L. H. PAMMEL. The effect of weeds upon crop production. *Proc. Iowa Acad. Sci.* 29: 271-279. 1922 [1924].—Greenhouse and field cultures of cereals and weeds, alone and mixed, with and without cultivation, were made in "galvanized pails 25 × 20 cm. in size." Loss of water was determined by weighing the pails. The authors conclude that a mixed culture gives off more water than a pure culture containing cereals only. The mixed culture reaches its maximum transpiration at a later date than a pure culture, thus shortening the time for the formation of the grain.—*H. S. Conard.*

1038. BARTLETT, H. Cotton trials in the Parkes district. *Agric. Gaz. New South Wales* 35: 647-648. 1924.—Small plats of cotton were grown upon a number of farms, resulting in a few successes. Upon 1 farm the crop yielded at the rate of 982 and 838 pounds of clean and stained cotton, respectively, per acre.—*L. R. Waldron.*

1039. BOAS, F., AND MERKENSCHLAGER, F. *Die Lupine als Objekt der Pflanzenforschung. Morphologie, Anatomie, Physiologie und Pathologie der gelben Lupine.* [The Lupine as object of plant investigations. Morphology, anatomy, physiology and pathology of the yellow lupine.] 144 p. Paul Parey: Berlin, 1923.—The life history of a plant is described. Attention is called to the ability of the plant to fix atmospheric N in the root tubercles, its relation to the fixed N and its calciphobus nature. The book brings together many investigations of Boas and of Merckenschlager together with an extensive literature. Commencing with the dormant seed the book carries the reader through the germination and the phenomena of swelling and enzymatic activity. The metabolic changes and physiology of nutrition of the growing and mature plant to the time of its death are exhaustively treated. Root excretions of the lupine, questions of permeability, symbioses, diseases of the lupine, and the lupine as culture plant are the titles of some of the chapters. The questions of sensitiveness to lime is thoroughly discussed.—*A. J. Pieters.*

1040. BOSMAN, G. J. Kafir corn and other grain sorghums. Certain crops for the semi-arid regions of South Africa. *Jour. Dept. Agric. Union South Africa.* 8: 163-166. 2 fig. 1924.—Kafir is surer than maize as a drought resistant crop for feeding live stock. It is beginning to occupy its rightful position in the semi-arid sections of the Union where it is rapidly displacing maize which has proved unprofitable on account of the insufficient and irregular rainfall. The areas suited to kafir in Southern Africa are very extensive, and the production will increase with the influx of settlers and the adoption of better methods of farming. The cultural methods of the crop are discussed.—*L. I. Goldblatt.*

1041. BOSMAN, G. J. Lucerne in South Africa. The country's foremost fodder crop. *Jour. Dept. Agric. Union South Africa* 8: 167-172. 4 fig. 1924.—The uses, cultural methods, marketing, etc. of lucerne are discussed. No forage crop cultivated in the Union is utilized in so many ways. Many large irrigation projects are now in hand which will open an approximate area of irrigable land amounting to 196,500 acres. If  $\frac{1}{2}$  of this acreage was sown to lucerne, the total output would be almost double its present yield. Outside of these irrigation schemes there still remain hundreds of thousands of acres that could be brought under irrigation.—*L. I. Goldblatt.*

1042. BOSMAN, G. J., AND I. B. OSBORNE. The maize industry of South Africa. The king of cereals. *Jour. Dept. Agric. Union South Africa* 8: 129-138. 6 fig. 1924.—The position and prospects of the maize industry and the economics and marketing, cultural methods, uses, etc., of maize are discussed. South Africa has exported only about 2-6% of the maize handled annually on the world's market. This country exports on the average,  $\frac{1}{4}$  of her annual production, the surplus after her own consumption of 10 million bags.—It is very essential that the average yield per acre in the Union should be increased, for at present it is the lowest of any country in the world, being about 3 bags or 10 bushels per acre.—The value of maize products, especially maize meal is emphasized, as the human consumption is not appreciated in the British Isles and on the continent. Crushed maize provides the best grain food that can be given to a working horse. In Great Britain the demand for maize for this purpose is small. Maize is a remarkable raw material which can be used in several industries. The full realization of this must inevitably lead to a greater industrial development within the Union, and a greater demand for the grain on the European market.—*L. I. Goldblatt.*

1043. BROWN, W. H. Condobolin experiment farm. The farm's results compared with



the district. *Agric. Gaz. New South Wales* 35: 619-625. 1924.—Reasons are given for the better yields secured from the experimental farm in comparison with yields from farms in the same district.—*L. R. Waldron*.

1044. CALVINO, EVA MAMELI DE. *Ventajas de la limitacion del numero de flores para la obtencion de la semilla del tabaco*. [Advantage in limiting the number of flowers for obtaining tobacco seed.] *Rev. Agric. Com. y Trab. Cuba* 5: 38-40. 1923.—Experiment shows that a larger amount and better quality of seed is obtained from tobacco plants in which only 5 flowers are left to mature.—*Edith K. Cash*.

1045. CALVINO, MARIO. *La seleccion del tabaco en la estacion experimental agronomica de Cuba*. [Tobacco selection in the Cuba Agricultural Experiment Station.] *Rev. Agric. Com. y Trab. Cuba* 5: 36-38. 1923.—The methods are described by which the Exp. Sta. attempts to select seed from healthy, vigorous plant of the *Havanensis* variety proved by chemical analysis to possess the qualities satisfying commercial demands. Directions for seed selection are given to Cuban tobacco growers in the form of circulars.—*Edith K. Cash*.

1046. CHATAWAY, T. D. *Wasted molasses and motor spirit*. *Australian Sugar Jour.* 16: 221-222. 1924.—For every ton of raw sugar produced, 5 hundred weight of molasses are left, which are capable of producing 16 gallons of spirit worth 2/6 a gallon, but up to the present time this by-product has been largely lost. A great advantage would accrue to the sugar mills from a self supply of all their requirements of motor spirit and fuel. The utilization of molasses for power alcohol involves no scientific or technical difficulties, and the writer believes the sugar mills could undertake the distillation of the molasses and that for reasons of economy a number of mills should combine in sending it to a central distillery. Queensland, it is pointed out, has the material to produce over 3,000,000 gallons of industrial spirit. Toward the end of the last year the Commonwealth Cabinet meeting at Canberra decided to use the distillation plant at Cannon Hill to manufacture motor spirit for Commonwealth requirements, and this factory is now establishing proof that molasses yields a spirit which will give satisfactory results in internal combustion engines.—*Nellie E. Fealy*.

1047. CHIEL, THE. *Umfoloji notes*. *South African Sugar Jour.* 8: 561-562. 1924.—It is suggested, now that payment by sucrose content is established, that the Umfoloji cane growers adopt on the flats the method followed in the Hawaiian Islands, that is to fertilize heavily in order to force the cane to maturity. In this connection it is pointed out that fertilizer is not only a plant food but an accelerator, and that good results follow when Uba cane is pushed by the judicious use of superphosphate or basic slag.—*Nellie E. Fealy*.

1048. CONFÉRENCE EXTRAORDINAIRE AGROPÉDOLOGIQUE. *Comptes rendus de la conference extraordinaire (III éme internationale) agropédologique à Prague 1922*. [Third international agropedological conference held at Prague, 1922.] 377 p. Imprimerie Politika: Prague, 1924.—In addition to an official report of this 3rd international conference on soil science the volume contains addresses delivered there by scientists from many lands. These papers cover such a wide range of related subjects as methods and types of soil analysis, the scope of soil science, physical and chemical characters of soils, agricultural uses of sulphur, nomenclature of soils, various phases of soil biology, relationships between soils and climate, teaching of soil science, etc.—*Frederick V. Rand*.

1049. DAWSON, C. A. *Sugar beet and sugar production*. *South African Fruit Grower* 11: 97-98. 1924.—The sugar consumption of the world is discussed with special reference to beet sugar. The properties of the sugar beet are given, and the cultural methods, climatic and labor requirements, disposal of the crop, etc., are discussed.—*L. I. Goldblatt*.

1050. DAWSON, C. A. *Sugar beet and sugar production*. *South African Fruit Grower* 11: 136-139. 1924.—The cultivation of the sugar beet, sugar making, etc., are fully discussed.—*L. I. Goldblatt*.

1051. DEEM, J. W. *Introduction of clover into pastures by surface sowing*. *New Zealand Jour. Agric.* 28: 331-332. 1924.—The difficult problem of how to obtain a catch of clover in a good stand of grass was solved by sowing 2 pounds each of red and white clover per acre, meanwhile allowing a large flock of sheep access to the field for a few days to tramp the seed into the ground.—*L. W. Kephart*.

1052. DEER, NOËL. *Cane Sugar*. A textbook on the agriculture of the sugar cane, the



manufacture of cane sugar, and analysis of the sugar-house products. 2nd ed., viii + 644 p. Pl. 1-29 (part, col.), fig. 1-358. Norman Rodger: London, 1921.—“The present edition of ‘Cane Sugar’ . . . has been completely rewritten. . . . During the 10 years that have passed between the issue of the 2 editions the writer has had the benefit of extensive experience in Cuba and in a New York refinery.” He has “made a survey of patent specifications dealing with sugar and sugar machinery, and much material thus found has been included.”—The 28 chapters of the work deal with the following phases of the subject: Description, morphology and physiology of cane, its composition, range and climate, variations in cane and cane varieties, soils of the cane-growing regions, manuring, irrigation, husbandry pests and diseases, harvesting, extraction of the juice by mills, the diffusion process, action of heat, alkalies and acids on sugars and cane juices, defecation of cane juice, carbonation processes, sulphitation, filtration, evaporation, sugar boiling and crystallization-in-motion, separation of the crystals, raw sugar, molasses, bagasse as fuel and the steam generating plant of the cane sugar factory, the polarimeter, determination of cane sugar and the assay of sugar-house products, determination of reducing sugars, control of the factory, and fermentation with special reference to the sugar-house.—Appendix comprises a bibliography, historical conspectus, addendum to “Variation in the cane and cane varieties,” and Munson and Walker’s Tables.—*Frederick V. Rand.*

1053. DIETRICH, F. O. *Zur Frage der Dünnsaat.* [The question of thin seeding.] Mitteil. Deutsch. Landw. Ges. 39: 613-614. 1924.—A re-statement of the authors argument in favor of thinner seeding of small grain is given.—*A. J. Pieters.*

1054. DRĂGAN, I. C. *Influența solului asupra germinațiunei.* [Influence of soil on germination.] Viața Agric. [București] 13: 326-333. 1922.—The experiments made on various types of soil with several varieties of wheat, rye, oats, buckwheat, tufted-vetch and lupine show the unfavorable effect of previous soakage of the seeds. This is an important statement as regards the culture of the damp, clayey or impervious lands, that must be improved by drainage in order to lower the water level and to correct the water-logging of the soil.—*Al. Borza.*

1055. EADIE, DUNCAN M. *The Natal sugar industry. Specialized farming in the cane belt.* Jour. Dept. Agric. Union South Africa 8: 156-162. 2 fig. 1924.—In the industrial world, sugar production has a unique feature; the grower of the raw material must be alongside the manufacturer of the finished article. Farm and factory may be capitalized by 1 individual or by a group of individuals, while scope is also offered for farmer and manufacturer to invest capital separately. Natal has both systems in practice. The individualistic system is at the foundation, but the practicability of the cooperative method is also fairly well established. The extent of the industry, economic structure, and marketing conditions are discussed. Owing to the Mozambique Current which sweeps the shores of Natal, the sugar cane belt has a tropical condition, although in a subtropical latitude.—*L. I. Goldblatt.*

1056. EHRENBERG, PAUL. *Silo und Silofutter und ihre Beziehungen zur Grünlandbewegung.* [Silo and ensilage and their relation to grass land utilization.] Mitteil. Deutsch. Landw. Ges. 39: 743-750. 1924.—After reviewing the present knowledge of silos and ensilage in Germany with respect to materials used, animals fed, etc., the author concludes that the silo must be relied on mainly as a means of conserving waste and surplus grass and other vegetable matter.—*A. J. Pieters.*

1057. FABER, HARALD. *Danmarks Landburgsproduktion.* [Denmark’s agricultural products.] Tidsskr. Landøkonomi 4: 193-240. 1924.—During 1923 Denmark produced 150,900 tons of wheat and 442,000 tons of rye, none of which were exported, while 847,000 tons of potatoes were produced of which 85,500 tons were exported. During the same period, 88,260 tons of butter, 20,600 tons of canned cream, 25,760 tons of eggs, 51,930 tons of dressed meat, 112,780 tons of pork and 3,770 tons of lard were exported. Additional agricultural statistics are given in this article.—*Albert A. Hansen.*

1058. FISHER, R. A. *The influence of rainfall on the yield of wheat at Rothamsted.* Phil. Trans. Roy. Soc. London B. 213: 89-142. 9 fig. 1924.—For a reliable statistical treatment, extensive crop data are required in the study of meteorological agriculture. The rain data have been analyzed for 65 years. There are some indications that wet years occur in cycles;



a continuous and progressive change is observable in the distribution of rain throughout the year; in other respects the sequence appears to be fortuitous. Rainfall changes account for only a portion of the slow changes observed in the yields. Curves showing the average effect on yield, for each additional inch of rain, throughout the year, have been obtained for 13 plots of Broadbalk wheat field, which have been under uniform experimental treatment since 1852. On all the plots dry weather is generally beneficial. A detailed comparison of the several plots indicates a predominant influence of the effect of rain in removing soil nitrates; the cause of other well-marked features cannot safely be asserted without further research, which it is hoped may be facilitated by the body of facts expressed in these curves.—*W. R. G. Atkins.*

1059. GOOD, JOSEPH A. *In the Hawaiian Islands.* South African Sugar Jour. 8: 507-511. 1924.—The author describes the methods of transportation used in Hawaii in connection with its principal industry, the production of sugar, and gives a brief description of the Hawaiian Islands, magnitude of the sugar industry, production, etc.—*Nellie E. Fealy.*

1060. HARDING, RICHARD JOSEPH ANTHONY. *Cotton in Australia; the possibilities and the limitations of Australia as a cotton-growing country.* xviii + 270 p. Longmans, Green & Co.: London and New York, 1924.—This volume gives an historical account of cotton culture in Australia, describes present and potential production and the climatic, soil, and agricultural conditions in the regions considered best suited for cotton, and outlines cultural methods and seed control. Notes on cotton diseases are appended, together with a summary of the life history of cotton in Egypt, and rainfall data.—*H. M. Steece.*

1061. HARRISON, JOHN B. *The principal varieties of sugar cane under cultivation in British Guiana during 1921, 1922, 1923.* Jour. Bd. Agric. British Guiana 16: 139-143. 1923.—The acreage and yields of the principal varieties of sugar cane of British Guiana are given in tabulated form.—*J. P. Jones.*

1062. HÉLIE, EDUARD. *Essai sur le Sorgho du Soudan.* Jour. Agric. Prat. 2: 496-497. 1921.—Rev. Bot. Appl. et Agric. Coloniale 2: 32. 1922.—The author, Agriculturist at Vienne, gives an account of his trial with Sudan grass. The aim was to procure, under droughty conditions, a green forage for use the latter part of the season. On the whole, the growth was satisfactory notwithstanding a persistent drought. One-fourth acre of land from which a crop of oats had been removed, produced green feed sufficient for 2 cows for 15 days. The best time to seed for such purposes is July 10-20, the grass being ready to cut by the end of September. Mr. Hélie states that his test confirms the earlier conclusions of M. P. Hoc that even though Sudan grass gives only 1 cutting, like maize, it is a more interesting forage plant, especially in a year of scarcity of forage, for the more northern regions, as well as for the Valley of the Garonne. The writer notes the present price of the seed is an obstacle to its general use.—*Erma Brown.*

1063. HOFFMANN. *Gestaltung einiger Massnahmen der Tabakkultur zur besonders wirkungsvollen Beeinflussung der Qualität.* [Present condition of certain measures in tobacco culture for especially influencing quality.] Mitteil. Deutsch. Landw. Ges. 39: 695-699. 1924.—This article deals with the main characteristics which determine quality in cigar leaf and in cutting or smoking leaf as affected by soil and climate and methods of fertilizing, growing, harvesting and curing, with special reference to the tobacco-growing district of the Pfalz. Application of those methods which will produce a serviceable tobacco even in unfavorable seasons constitutes a cardinal feature of successful tobacco culture. The principal characteristics of fine cigar tobacco are faultless burning qualities, a light body, mature color and, for wrapper leaf, a perfect texture and low percentage of stem; cutting leaf should have a light color, satisfactory combustibility and very fine veins. Suitable methods for improvement of quality in a given region will be most effective when directed toward the production of that type of tobacco most favored by the average weather conditions. In the Pfalz region, the heavier rainfall and uniformly high temperature to the south favor the production of cigar leaf, while to the north the lighter rainfall and warm days but cool nights promote the growth of light colored tobacco. The soil is of the same character in the 2 districts. For bright cutting leaf, not to exceed 16 tons per acre of barn manure, applied in the fall, may be safely used, and for cigar leaf somewhat heavier rates of application may be made. The manure should be supplemented with a nitrogeous fertilizer, preferably urea, which in comparative



tests has given better quality than has  $(\text{NH}_4)_2\text{SO}_4$ . Excessive fertilizing with N markedly delays ripening of tobacco. Liberal applications of potash improve both the burn and the color of cigar leaf while in the bright tobacco district the color, but not the burn, of the leaf is notably improved. Whether potash salts containing Mg would be beneficial has not been determined. Early planting and relatively close spacing in the field are recommended. It is important to avoid topping too early. The best method of harvesting is to pick the leaves in 3 lots at intervals which vary with several factors. Formerly, curing in the open was generally believed to be the only correct method. More recently, cigar tobacco is coming to be cured under cover but it is found that light has a definitely beneficial effect on the color of bright tobacco. For better control of conditions curing chambers with walls consisting of Venetian blinds are recommended.—W. W. Garner.

1064. HORST, WILLEM ADOLF. Studien über Gambhanf. [Studies in Gambo hemp (Ambari. *Hibiscus cannabinus*.)] Faserforschung Band 4. Heft 2. P. 61-124. 8 pl. (6 col.) 5 fig. 1924.—The origin of the plant is not definitely known, because of the confusion of names, both common and botanical, applied to species of *Hibiscus* and allied genera, and because of some variation in the species itself. Seven different forms based on colors of flower and stem are segregated. The fiber is similar to jute and is suitable for textiles. The plant has been in cultivation a century, developing many forms which present difficulties in systematic classification. The flowers are mostly self-fertilized. The tolerance or range of Ambari is somewhat greater than that of jute. The ultimate fiber cells of Ambari are mostly longer, wider, and thicker-walled than jute cells. The fiber is somewhat less lignified than jute fiber. Water, ash and cellulose content show little difference compared with jute. With 2 quick methods it is possible to estimate with reasonable assurance profitable fiber production in the cultivation of *Hibiscus cannabinus*. The bark is about  $\frac{1}{4}$  of the total weight of the stem and it contains 30 to 50% of fiber. The fiber content of the Ambari stem is greater than that of hemp. The fiber is most nearly like that of the sunn fiber from *Crotalaria usaramoensis*. A bibliography of 45 citations is given.—L. H. Dewey.

1065. HUTCHESON, T. B., AND T. K. WOLFE. The effects of fertilizers and hybridization on maturity and yield of corn. Virginia Agric. Exp. Sta. Tech. Bull. 27. 1-20. 3 fig. 1924.—This is a study of the relation of fertilizers on corn in rotation and continuous culture plats, to maturity, yield, shelling percentage, percentage of marketable grain, matured ears, and pounds of shelled corn per pound of stover. Acid phosphate was the most important single fertilizer in both experiments. In the rotation experiment, a combination of fertilizers containing acid phosphate was generally more effective than a combination lacking acid phosphate, and also more effective than any commercial fertilizer when used alone. Under continuous cropping, phosphates alone were generally more effective than any combination of commercial fertilizers or any single commercial fertilizer, while under rotation the right proportion of  $\text{NH}_3$  phosphoric acid and potash was more effective in promoting growth and maturity than any single element. Under rotation the soluble phosphates were more effective than the insoluble phosphates while both were equally effective under continuous culture. A striking interrelationship existed in the rotation experiment between yield and percentage of matured ears, percentage of marketable grain, shelling percentage, and pounds of shelled corn per pound of stover, but this was not shown to the same degree under continuous cropping. Hybrids grown in comparison with the parents produced tassels and silks earlier, on the average, than the parents and also yielded higher than the average for the parents. The cross, Johnson County White  $\times$  Gold Standard, was especially favorable.—F. D. Fromme.

1066. ILIFFE, R. O. Hints to a paddy cultivator. Jour. Bd. Agric. British Guiana. 16: 199-204. 1923.—A discussion of methods of cultivation, seed selection, harvesting, and storage of the paddy crop is given.—J. P. Jones.

1067. INDIANA AGRIC. EXP. STA. Purdue handbook of agricultural facts 1924. 223 p. Illus., maps, diagr. Purdue Univ. Agric. Exp. Sta.: La Fayette, Indiana, 1924.—This volume, in handy size, is a condensed compilation of useful agricultural information from many sources. The topics include rural economics and organization, crop and livestock production, home economics, rural engineering, insect disease and weed control, soils and rural laws.—L. W. Kephart.



1068. INTERNAT. COTTON CONGRESS. **Official report, the eleventh International Cotton Congress, Stockholm, June 14-16, 1922.** 256 p. Taylor Garnett Evans & Co.: Manchester, England, 1922.—In addition to the official report of the proceedings, papers of botanical interest were given on the testing of raw cotton as regards humidity; the cotton supply, distribution and consumption; and papers on various phases and possibilities of cotton growing in the Belgian Congo, Brazil, Egypt, India, the British Empire and its colonies, the French colonies, China, Italian Somaliland, and Spain.—*Frederick V. Rand.*

1069. INTERNAT. INST. AGRIC. **The international institute of agriculture; its organization, activity and results.** 51 p. 1 pl. Rome, 1924.—An illustrated account of the history, organization and work of the Internat. Inst. Agric. is given.—*L. W. Kephart.*

1070. JEAN, FRANK C., AND JOHN E. WEAVER. **Root behavior and crop yield under irrigation.** Carnegie Inst. Washington [D. C.] Publ. 357. V + 66 p. 24 fig., 6 pl. 1924.—Several different agricultural plants were grown in 1922 and 1923 in plots of  $\frac{1}{3}$  of an acre at Greeley, Colorado, in similar soils unirrigated, semi-irrigated and fully irrigated. The main objective was to determine the influence of the different quantities of water on root development and yield. Soil and air temperatures, air humidity and evaporation were almost identical for the several plots in 1923 and only slightly more severe for the unirrigated soils in 1922. Marked and consistent differences in the development of the several crops were shown at different stages of growth for the different plots, due chiefly to differences in water-content of soil.—Alfalfa roots pursued a more tortuous course in the unirrigated soil than when irrigated. They had more and longer major laterals, especially in the upper soil layers. During the earlier growth the laterals reached depths almost as great as those attained by the tap root. Tubercle growth was greatly retarded in the unirrigated soil. Wheat roots spread more widely in the superficial soil layers when unirrigated than when irrigated, primary branches were longer and occurred nearer the root tips, and the secondary branches were much more numerous in the irrigated soil. The working level (depth at which roots were most numerous) was only about 60 cm. in unirrigated soil, while it was about 90 cm. with light irrigation and 130 cm. with full irrigation. When the unirrigated soil was more moist (season of 1923) the root habit for that soil resembled that for the lightly irrigated soil of the preceding year and the yield was greater for the moister season by 3-25 bushels per acre. Beet roots in unirrigated soil were limited in the downward penetration of the tap-root in unirrigated soil, these tap-roots being only  $\frac{1}{2}$  as long as in moist soil. Branching was more profuse and sublaterals were more abundant in unirrigated than in fully irrigated soil. The lightly watered plants were intermediate in this respect. Roots in fully irrigated soil regularly reached a depth of about 180 cm., each root system occupying about 0.7 cu. m. of soil. Potato tops were smaller, but the root systems were much more extensive in unirrigated soil when 6 weeks old, at which time growth practically ceased. In lightly irrigated soil the roots extended deeper than in fully irrigated soil. Potato yield was 19 bushels per acre in unirrigated soil and 303 bushels per acre with full irrigation. Maize roots in unirrigated soil deviated from the usual shallow, widely spreading type for this plant, growing obliquely or even directly downward; those in immediately dry soil turned downward after 1st spreading laterally. Number and length of root branches were greater as the soil water supply was smaller. Unirrigated maize roots had a working level of about 75 cm. and these plants yielded 25 bushels per acre; in the fully irrigated soil the roots reached a depth of about 180 cm. and the yield was 102 bushels per acre, but the greatest yield obtained (115 bushels per acre) was from the lightly irrigated plants which had the best developed roots and a working level of about 150 cm.—*B. E. Livingston.*

1071. JENSEN, JOH. **Det sønderjydske Landburg.** [Agriculture of South Jutland.] Tidsskr. Landøkonomi 4: 241-248. 1924.—An account is given of the agriculture of the province of Slesvig, restored to Denmark from Germany after the world war.—*Albert A. Hansen.*

1072. JOHNSON, ETHELBERT. **A new noxious weed in California.** Monthly Bull. California Dept. Agric. 12: 92-105. Fig. 36-43. 1923.—Russian knapweed or Turkestan thistle, *Centaurea repens* L. (*C. picris* Pall.), was officially noted in California in 1920 and identified in 1922. It occurs in many sections of the State. Its production of underground stems makes it of noxious character. It was introduced in Turkestan alfalfa seed. When the underground



stems are cut they throw out many new shoots. A botanical description of the weed is given. Two years of fallow plowing will control the weed. Carbon bisulphide applied at the rate of 2-4 ounces in holes 12 inches deep and at distances of 18 by 30 inches will effectively poison the weed. There is hope for its complete eradication.—*E. L. Overholser*.

1073. JOHNSTON, T. HARVEY. **The Australian prickly-pear problem.** Rept. Australasian Assoc. Adv. Sci. 16: 347-401. Fig. 1-3. 1923.—Approximately 90 million acres in Australia are infested with the prickly-pear cactus, species of *Opuntia* and *Nopalcea*, which were originally introduced from the New World. Control methods have been studied from various standpoints and the following conclusions have been reached: (1) Legislation should compel clearing of lightly infested regions; (2) chemical means are the only rapid method of eradication, but they cannot be applied generally because of excessive cost; (3) no industrial use could utilize the plants on a large enough scale to effect eradication; (4) biological means directed against every part of the plant are the only feasible methods of control. Among the organisms utilized are certain beetles and weevils which eat the outer tissues; larvae of certain moths which feed within the segments; larvae of beetles which feed on underground parts; cactus bugs and cochineal insects which feed upon the juices; cactus midge larvae which feed upon the fruit; scavenger flies whose young devour tissues injured by other organisms; fungous and bacterial enemies which do not parasitize other plants, *Gleospodium lunatum* and *Bacillus cacticidus* Justn. & Hitchcock, being the only effective ones; and various insects valuable as agents of transmission of fungous or bacterial parasites.—*Ray C. Friesner*.

1074. KEARNEY, THOMAS H., AND C. S. SCOFIELD. **The salt content of cotton fiber.** Jour. Agric. Res. 28: 293-295. 1924.—Reports of difficulty in spinning the fiber of American Egyptian cotton (Pima variety) which is produced under irrigation in Arizona, often on saline soils, made it desirable to investigate the salt content and hygroscopicity of this fiber in comparison with other commercial cottons. Pima fiber was found not to differ materially in these respects from fiber of Upland and Sea Island cottons, whether produced in Arizona or in South Carolina.—*T. H. Kearney*.

1075. KEEN, B. A. **International conference on soil science.** Nature 114: 25-26. 1924.—This is a brief report of the meeting held at Rome, May 12 to 19, 1924.—*O. A. Stevens*.

1076. KNOCH, K. **Die Möglichkeit der Abschätzung des Ernteertrages auf Grund meteorologischer Angaben.** [The possibility of computing the decrease of harvest on the basis of meteorological reports.] Naturwissenschaften 11: 769-776. Fig. 1-2. 1923.—A discussion is given of the factors entering into such computations, with examples, based on American weather reports.—*Orton L. Clark*.

1077. KRISTENSEN, R. K. **Eksempler paa Bestemmelse af Middelfejlen ved Markforsøg.** [Detecting errors in field experiments.] Tidsskr. Planteavl 30: 527-532. 1924.—Sources of error, particularly due to differences in soil, are discussed and explained by means of a series of diagrams.—*Albert A. Hansen*.

1078. LAMONT, W. J. **Wheat and winter cereals of South Africa. The crops of the first settlers.** Jour. Dept. Agric. Union South Africa 8: 139-144. 2 fig. 1923.—The Cape Province, the western portion of which enjoys an ideal climate for the production of winter cereals, produces 76% of the Union's wheat, over 80% of the oat-crop (grain) and nearly 50% of the oat-hay, 92% of the barley and 82% of the rye-harvest. The average yields in bushels per acre of the various provinces are very low, and may be explained by the comparatively poor soils on which wheat is grown as a regular crop; by the diversity of climatic and other conditions and by faulty methods of cultivation, of use of fertilizers, and of systems of farming. The importance to South African agriculture and the cultural methods for oats, barley, and rye are discussed.—*L. I. Goldblatt*.

1079. LEES, R. D. **Root development in wheat.** Agric. Gaz. New South Wales 35: 609-612. 1924.—A study of root penetration of 2 varieties of wheat, early and late sown, with different amounts of P applied as superphosphate, was made in 1923. In practically all cases it was found that applications of superphosphate at rates varying from 50 to 200 pounds per acre increased root penetration in comparison with plants grown without fertilizer. Root penetration was deepest in the early sown variety. In a study of other varieties grown under similar conditions, it was found that, with the exception of 1 variety, roots penetrated to approximately the same depth.—*L. R. Waldron*.



1080. LEPPAN, HUBERT D. *Lucerne culture in South Africa*. 68 p. *Illus.* South African Agric. Ser. 2. So. Africa Central News Agency, Ltd., Pretoria. 1924.—This is a rather brief but general treatise on alfalfa, discussing its growth and utilization, particularly as applied to South African conditions.—*H. L. Westover*.

1081. LINDHARD, E., AND J. C. LUNDEN. *Dyrkningsjorsög med Rodfrugtstammer, Barres og Kaalroe, 1920-1923*. [Experiments with Barres and Kaalroe varieties of turnips.] *Tidsskr. Planteavl* [Røbenhavn] 30: 415-526. 1924.—Both varieties are well known to truck farmers. Results of improvement trials by means of better seed, fertilization, and cross breeding are reported. The Kaalroe is a cross between turnip and cabbage (as indicated by the common name, Kaal meaning cabbage and roe, turnip) that has been successfully cultivated in Denmark for several years. Results of crossing with the Barres turnip are reported and illustrated with diagrams. One large, hardy hybrid was produced at Nosgaard.—*Albert A. Hansen*.

1082. McLOUGHLIN, D. E. *Maize for export, with definitions of grades and grading regulations*. Rhodesia Agric. Jour. 21: 283-290. 2 fig. 1924.—The export of Rhodesian maize and the desirability and means of securing a superior product are discussed.—*L. I. Goldblatt*.

1083. MANSVELT, N. L. *The business of tobacco growing along the Vaal River*. Jour. Dept. Agric. Union South Africa 8: 337-339. 1924.—The article deals with the need for cooperation among the tobacco growing farmers in certain districts, and the want of a healthy stimulus to induce the farmer to turn out tobacco of the best quality. Owing to the absence of these factors, tobacco of a very poor quality is produced.—*L. I. Goldblatt*.

1084. MASCHHAUPT, J. G. *De invloed van grondsoort en bemesting op het gehalte onzer cultuurgewassen aan stikstof en aschbestanddeelen*. [The influence of soil and fertilizers on the content of N and ash in our culture plants.] *Verslag. Landbouwk. Onderzoek. Rijkslandbouwproefsta.* [Nederland] 22. P. 25-116. 1918; 23. P. 40-56. 1919; 25. P. 115-130. 1921 (see Bot. Absts. 12, Entry 972); 27. P. 114-124. 1922.—In the first paper (1918) the conclusion is reached that the nature of the soil has more influence on the N and ash content of the straw of grains and on the foliage of potatoes and beets than on the composition of grain, of beets and potatoes. The influence of the nature of the soil is strongest on the  $\text{SiO}_2$  content of straw, this being 5 times as great on clay as on peat soils, but this increased  $\text{SiO}_2$  is not necessarily accompanied with an increase in basis. The effect of soil is, excluding  $\text{SiO}_2$ , much greater for beet and potato foliage than on the straw of grains. Great variations occur in N,  $\text{P}_2\text{O}_5$ ,  $\text{K}_2\text{O}$  and CaO, but especially in the  $\text{K}_2\text{O}$  content of potato foliage. In grain straw the effect commonly to be noted is in the content of  $\text{P}_2\text{O}_5$ , sometime also in N and  $\text{K}_2\text{O}$ . The other papers, continued from the 1st of the series, are along the same general lines.—*A. J. Pieters*.

1085. MENDIOLA, NEMESIO B., AND JUAN O. UNITE. *Sugar cane breeding in the College of Agriculture. III*. Philippine Agric. 13: 115-128. 1924.—Chemical analyses and descriptions are given of several new varieties of sugar cane (*Saccharum officinarum*), adapted to the Philippine Islands.—*Sam F. Trelease*.

1086. MITSCHERLICH, ALFRED. *Nochmals: Das Wirkungsgesetz der Wachstumsfaktoren*. [Again: the law of growth factors.] *Mitteil. Deutsch. Landw. Ges.* 39: 593-594. 1924.—A brief semi-popular statement of this law is given.—*A. J. Pieters*.

1087. MONTEMAYOR, ZOSIMO T. *Mass selection in Philippine rice fields*. Philippine Agric. 13: 167-175. 1 pl. 1924.—Mass-selection of seed from fields having several seedlings in a hill did not always give increased yield. Mass-selection from a field planted 1-plant-to-the-hill gave increased yield when planted in the same way.—*Sam F. Trelease*.

1088. MUNDY, H. G. *Maize production on the sand veld*. Rhodesia Agric. Jour. 21: 277-280. 1924.—Better methods of farming for the Rhodesian sand veld are gradually coming into practice. An outline of some of these methods is given. The land is typically granite or contact sand. The practice of permitting land which has carried 1 or 2 consecutive crops of fertilized tobacco to revert to grass without first taking 1 or more crops of maize, ground nuts, or sunflower is most wasteful. The excellent yield of maize or nuts obtained is proof positive of the considerable residue of plant food left in the soil after the last crop of tobacco is removed. Rotations for the sand veld are given with and without tobacco.—*L. I. Goldblatt*.

1089. MUNDY, H. G. *Report of crop experiments*. Gwebi Experiment Farm, 1922-1923.



Rhodesia Agric. Jour. 21: 172-178. 4 fig. 1924.—The general crop returns afford striking proof of the advisability of growing a variety of crops in Rhodesia. The season was too wet for stock melons and pumpkins, but was favorable for sweet potatoes and maize for silage, which yielded well. The report deals with rotation experiments of maize in different courses.—*L. I. Goldblatt.*

1090. NAGAI, ISABURO. On the relation of leaf area to productivity in soybean. (Japanese.) Jour. Sci. Agric. Soc. 228: 603-624. 1921.—The inter-varietal difference in the size of a crop of soybeans is closely correlated with the respective differences in the leaf area and certain other characters when grown under the similar conditions. In 1917 and 1918 the author made the following observations with 114 varieties of soybeans grown at the Riku-u-Sub-Station of the Agricultural Experiment Station at Omagari. Expressing the mean leaf area per plant of each variety in sq. cm. (measured on August 25), and the yield in grams (seed) from the unit area (one "tsubo"), comprising 36 plants, when harvested, the following relation has been found:  $\bar{x} = 554.3 \pm 22.16$ ,  $\bar{y} = 2241.45 \pm 105.71$ ,  $\sigma_x = 239.4 \pm 15.650$ ,  $\sigma_y = 114.35 \pm 74.753$ ,  $r_{xy} = +0.732 \pm 0.043$ ,  $x = 207.875 + 0.155y$ , where  $x$  is the yield of seed,  $y$  the leaf area, and  $\bar{x}$ ,  $\bar{y}$  are the respective means. Between the yield and the mean area of a single compound leaf, we find  $r = +0.640 \pm 0.057$ , and the regression straight line is  $x = 0.843 + 0.0497y$ .—The following inter-varietal correlations are found among the following characters: Mean area per plant versus mean height ( $+0.740 \pm 0.042$ ); mean area of single compound leaf versus mean height ( $+0.650 \pm 0.055$ ); total leaf area per plant versus area of single compound leaf ( $+0.87$ ); weight of 100 seed versus mean area of single compound leaf ( $+0.469 \pm 0.075$ ); weight of 100 seed versus mean height ( $+0.299 \pm 0.087$ ).—The magnitude of assimilation by the leaf in the field and its relation to the climatological factors has been studied. The value of weight-increase of the leaf, gm<sup>2</sup>h ( $x_1$ ), to daily hours of sunshine ( $x_2$ ), temperature ( $x_3$ ), and relative humidity ( $x_4$ ) are correlated to the following extent:

	JUNE 3-31, 1917 (26 DAYS)	AUG. 1-30 (27 DAYS)	SEPT. 11-29 (18 DAYS)
$\bar{x}_1$	0.675±0.018	0.634±0.029	0.502±0.037
$\sigma_1$	0.144±0.014	0.224±0.021	0.233±0.026
$\bar{x}_2$	6.18 ±0.408	6.96 ±0.559	3.729±0.557
$\sigma_2$	4.19 ±0.392	4.307±0.395	3.501±0.394
$\bar{x}_3$	25.16 ±0.288	24.797±0.289	20.561±0.354
$\sigma_3$	2.18 ±0.204	2.229±0.205	2.229±0.251
$\bar{x}_4$	73.3 ±1.591	75.11 ±1.492	79.17 ±1.644
$\sigma_4$	12.03 ±1.125	10.724±0.984	10.344±1.163
$r_{12}$	+0.26 ±0.123	+0.11 ±0.128	+0.54 ±0.112
$r_{13}$	+0.06 ±0.132	+0.49 ±0.098	+0.03 ±0.142
$r_{14}$	-0.44 ±0.107	-0.20 ±0.125	-0.49 ±0.121
$r_{23}$	+0.52 ±0.097	-0.25 ±0.122	-0.38 ±0.136
$r_{24}$	-0.81 ±0.046	-0.61 ±0.082	-0.51 ±0.118
$r_{34}$	-0.62 ±0.081	-0.29 ±0.119	-0.51 ±0.117

The correlations between the yield (mean of nine varieties) and the weather during the period of 1892 to 1919 are as follows:

	JUNE	JULY	AUGUST
Mean temperature.....	+0.100	+0.100	+0.017
Sunshine.....	+0.127	+0.087	+0.495
Precipitation.....	-0.357	-0.285	-0.076

—Author. (Courtesy Japanese Jour. Bot.)

1091. NOLTE, O. Die Bedeutung des Kalis für die landwirtschaftlichen Kulturpflanzen. [The importance of potash for agricultural plants.] Mitteil. Deutsch. Landw. Ges. 39: 634-



636. 1924.—This reports the effect of potash in 21 trials with potatoes and in 1 with barley.—*A. J. Pieters.*

1092. NOLTE, O. Über Wirkung und Rentabilität der Stickstoffdüngung bei verschiedenen Kulturpflanzen. [Concerning action and profitableness of nitrogenous fertilizers with various cultivated plants.] Mitteil. Deutsch. Landw. Ges. 39: 675-683. 1924.—The author studied especially the profitableness of  $(\text{NH}_4)_2\text{SO}_4$  applications. He shows what increase in grains is necessary to pay for given applications of fertilizer and gives data showing that, with a few exceptions, all applications paid on winter rye, oats, mangels, poatoes and winter wheat. The small applications of  $(\text{NH}_4)_2\text{SO}_4$  were least likely to be profitable and the author advises the use of the fertilizer, if limited in quantity, on part of the fields in sufficient amount to yield a profit rather than to spread the same quantity over a larger area. The details of the reports are given in 6 pages of tables.—*A. J. Pieters.*

1093. OSBORNE, J. B. Peanuts. A South African product of high commercial value. Jour. Dept. Agric. Union South Africa 8: 173-176. 3 fig. 1924.—The characteristics, uses, export prospects, cost of production, etc., of this crop, are discussed. Peanuts as a crop can be grown profitably in large areas of South Africa. Being a legume, this crop is well suited to rotation with cotton, sorghum and maize. For low veld areas, it is a more certain cash crop than maize. Peanuts can be safely recommended to South African farmers; the product has a place on the world's markets, and the cost of production is comparatively small. Moreover, if the market does not justify the sale of the product, every part of the crop may with advantage be used for feeding on the farm.—*L. I. Goldblatt.*

1094. PARDY, A., J. W. MCGILLIVRAY, AND H. H. CORNER. Reports on field experiments with oats, turnips, and potatoes. North Scotland Coll. Agric. Bull. 28. 1-76. 3 fig. 1923.—Cooperative experiments reported for 1919, 1920, and 1921 include variety and fertilizer tests with oats and potatoes and milling and cultural trials with oats. The comparative yields and composition of varieties of swedes and turnips are tabulated.—*H. M. Steece.*

1095. PARISH, E. Economics of maize growing in South Africa. Jour. Dept. Agric. Union South Africa 8: 291-318. Fig. 1-6. 1924.—This is a lengthy treatise on all aspects of maize growing. Among other conclusions the following are drawn: (1) Manual labor in South Africa, of which fully 90% is native labor, is comparatively expensive; (2) ox labor is hardly as expensive as other forms of draught; (3) land for maize farming is comparatively cheap; (4) implements and other equipment are dear and the depreciation and cost of repairs high. On the average the profit on maize farming is low, and usually does not permit of a high standard of living, the reasons being mainly that maize is still largely grown on the wrong system, and that an appreciable quantity is grown in districts where the conditions are not particularly suitable.—*L. I. Goldblatt.*

1096. PIETERS, A. J., AND G. P. VAN ESELTINE. Korean lespedeza: a new forage crop. U. S. Dept. Agric. Dept. Circ. 317. 1-14. 11 fig. 1924.—*Lespedeza stipulacea*, a species not heretofore grown in the U. S. A. was introduced from Korea in 1919 by the U. S. Dept. Agric. It is an annual plant of the type of *L. striata* but is larger and coarser, grows more rapidly and matures 2-3 weeks earlier. The earlier maturity is not desirable in the southern U. S. A., but it acts to extend the range of lespedeza much farther north. Preliminary tests indicate that the plant may be a valuable grazing crop for poor, acid soils between Pennsylvania and southern Virginia and westward to central Kansas.—The habits, history and taxonomy of the species are discussed in detail.—*L. W. Kephart.*

1097. PILLAI, N. S. K., AND K. A. PILLAI. Cereal-groundnut-rotation experiment on the Palur Agricultural Station. Yearbook Madras Agric. Dept. 1922: 57-70. 1923.—Tabulated yields and costs from 1913 to 1921, inclusive, showed that yields of peanuts declined notably in continuous culture. Interplanting peanuts with a cereal was more profitable than growing the crops in alternate years. Changing the cereal used in interplanting gave better yields than where the same cereals were used every year.—*H. M. Steece.*

1098. PRIESTLEY, J. H., AND L. M. WOFFENDEN. The healing of wounds in potato tubers and their propagation by cut sets. Ann. Appl. Biol. 10: 96-115. 3 fig. 1923.—The 1st step in the healing process is the deposition of a fatty "suberin" layer as a product of the oxidation of the drying cell sap. After 24-48 hours, a cork layer is formed below this suberin layer. The



relation of environmental factors to healing is discussed with regard to practical applications.—*J. G. Leach.*

1099. REYNOLDS, MARK H. **Fallow and crop competition.** Phillip agricultural bureau. Agric. Gaz. New South Wales 35: 626-628. 1924.—This article deals only with the fallow competition for which scorings were made upon moisture, mulch, weeds, consolidation, and cultivation.—*L. R. Waldron.*

1100. REYNOLDS, MARK [H.]. **Mount Russell maize-growing competition.** Agric. Gaz. New South Wales 35: 646. 1924.—In this competition seed were furnished by different men and the varieties were grown upon 1 farm. The variety Kennedy gave the maximum yield of 39 bushels, seed of which were furnished by the Dept. Agric.—*L. R. Waldron.*

1101. RICHARDSON, A. E. V. **The water requirements of farm crops.** Rept. Australasian Assoc. Adv. Sci. 16: 743-800. Pl. 12, fig. 1-4. 1923.—Water requirements (transpiration ratio) were determined under field and laboratory conditions for wheat, barley, oats, lucerne, rape, peas, maize, millet, and amercane. The transpiration ratio of barley is lower than that of other cereals; that of winter-grown wheat is lower than for the same variety, summer-grown; that of millet and amercane is lower than for wheat and maize. Yearly curves show that wheat, barley, and oats reach their maximum water requirements in October. Seventy-seven per cent of the total water is required during September, October, and November. Similar experiments at different stations and during different years show a close parallel between water requirements and changes in environmental conditions. Experiments carried on in a pot-culture house showed that average transpiration ratios for plants grown in the house are approximately the same as for those grown in the field. Experiments with different varieties of wheat showed little variation in ratios. Yandilla King (*Triticum sativum*) showed the lowest ratio (209); Hugenot (*T. durum*), the highest (243). Other varieties were used: Federation and Darts Imperial (*T. sativum*), Indian 5 (*T. compactum*) and Kubanka (*T. durum*). The transpiration ratio is not materially affected by variations in water content of soil. Moderate degrees of soil saturation give lower ratios than either high or low degrees of soil saturation, but the ratio for grain increases with increased water content. The percentage of grain to straw is greatest at 60% saturation and decreases with variation in either direction. Increased soil saturation is accompanied by decreased root development, and vice versa. Use of nitrates and phosphates as fertilizers are accompanied by reduced ratios. Seasons with higher rainfall have lower ratios, and vice versa. Application of water requirement values to yield of wheat under farming conditions in Victoria show that the best growers are securing the results theoretically possible, namely,  $3\frac{1}{2}$  bushels per acre per inch of rainfall; but the average for the state is only  $\frac{1}{3}$  of this rate.—*Ray C. Friesner.*

1102. RODRIGO, PEDRO A. **The effect of spacing on tillering and production of three varieties of rice.** Philippine Agric. 13: 5-28. 1924.—Among 6 distances of planting (10, 15, 20, 25, 30, and 40 cm. apart each way) with 1 plant per hill, 30 cm. apart gave the best yield for 2 varieties and 25 cm. gave the best yield for the 3rd variety tested. The greater the space allowed to each plant, the greater the number of fruiting culms per plant, but the smaller the number per sq. m. A large number of fruiting culms per unit area did not always indicate a higher productivity.—*Sam F. Trelease.*

1103. ROSA, J. T., JR. **Seed potatoes for better yields.** Missouri Agric. Exp. Sta. Circ. 106. 1-8. 1922.—The author considers the use of suitable seed potatoes an important factor in the production of satisfactory yields. Recommendations are made as to the most suitable varieties to plant for early and late crop production. Three factors are considered important in late crop production: (1) keeping seed dormant, (2) securing a full stand, and (3) disease control. Differences in strains within a variety are noted, as is also the behavior of northern versus home-grown seed potatoes. Sprouting of seed potatoes and size of seed piece were also studied.—*W. Stuart.*

1104. RUSCHMANN, GERHARD. **Grundlagen der Röste. Eine wissenschaftlich-technische Einführung für Bakteriologen, Landwirte, Röster, Spinner und Fachschüler. Fundamentals of retting. An agricultural-technical presentation.]** Bucherei der Faserforschung. 1.  $x + 188$  p., 27 fig. S. Hirzel, Leipzig, 1923.—A brief sketch is given of the history of flax from its production in ancient Egypt in A. D. 1800, and a more detailed account of the progress



since that time in knowledge of retting. A brief review is given of the results pertaining to retting in the chemical work of Payen, Frémy, Mangin, von Fallenberg and Ehrlich, the botanical studies of von Mohl, Mangin, and Havenstein, the bacteriological studies of van Leeuwenhoek, Plenciz, de Latour, Schwann, Kützing, Pasteur and R. Koch, and the studies in pectin decomposition or retting by van Tieghem, Friebe, Winogradsky, Behrens, Beijerinck, van Delden and Störmer. The flax industries of Russia and Germany and the retting methods in practice are described. The anatomy of the flax stem is described and illustrated and its chemical constituents are given in detail. With this groundwork of what has been done by early workers, and a thorough knowledge of the material to be worked with, a study is made of various groups of bacteria and also molds and ferments in connection with retting. More extended studies with *Bacillus amylobacter*, which is regarded as a group of closely associated organisms rather than as a single species, indicates that the organisms of this group are the active agents in retting. These organisms necessary for retting are always present in flax retting solutions. Experiments with *Bacillus felsineus* Carbone, and *Bacillus comesii* Rossi, recommended for pure culture in retting, indicate that they are not efficient for retting. Careful studies were made by the author in retting flax with anaerobic bacteria in warm water, and the progress of retting is described under the physiological phase in which the tissues become water-soaked and swollen; the biological "vorphase," in which numerous bacteria and low forms of fungus and protozoa develop, the preponderance of different kinds depending on various factors, as temperature, acidity, and movement of the water; and the biological "hauptphase," in which the pectins are reduced and the final work of retting is perfected by a limited group of organisms. Canal-retting, a system devised by H. Schneider and carried on commercially in Germany, is described in detail. In this system the bundles of flax pass slowly through an artificial tank in a slow current of water under temperature control. An essential feature is the continuous feeding of fresh flax straw at one end of the canal or long narrow tank and the taking out of the retted straw at the other end. The work is thus continuous. A disadvantage is found in the increasing acidity due to the fermentation of the refuse settling in the bottom of the tank, which also retards proper movement of the retting water. The aerobic Rossi process is briefly described, as is also dew-retting. An extensive bibliography of papers relating to retting is given. This paper gives a very complete summary of the knowledge of retting up to the present time, but is not simply a compilation. It gives the verified results of other workers and then the results of researches by the author.—*L. H. Dewey.*

1105. RUSSELL, E. J. JOHN. **Farm soil and its improvement.** 128 p., 27 pl. Ernest Benn: London, 1923.—This book is written for farmers, its object being to give practical information about soils and manures. The advice is based on results obtained from experiments at Rothamsted and from other reliable sources. The author has covered the subject briefly and statements are given in simple language. The following subjects are discussed: (1) Soil fertility; (2) virgin soils, "The soil as nature left it;" (3) plant and animal life in the soil, "The soil as the abode of a great population;" (4) cultivation; (5) weather, climate and systems of husbandry; (6) soil types and systems of husbandry; (7) how to control soil fertility, especially the nature and functions of manures and value and uses of different types of fertilizers; (8) conclusions. The author presents his material according to a generally accepted conception that plants have the following main requirement: (1) Air, not only for leaves, but also for roots; (2) water, sufficient, but not too much, and given at the right time; (3) proper temperature; (4) food, which must be of the right kind given at the proper time and in the proper quantity; (5) absence of injurious agents, of which a good many are known to exist; (6) sufficient root room, which implies not only sufficient depth of soil, but freedom from excessive competition from other plants. The characteristics of nitrogenous, potassic, and phosphatic fertilizers are set forth and their differing effects on the soil and plant described. The deficiencies of virgin soil and the advantages of certain types of such soil are pointed out. Not only the visible life of the soil, such as insects, earthworms, etc., are enumerated and described briefly, but also the invisible organisms such as bacteria, are discussed and their value in some cases and injurious nature in others are indicated. Cultivation and drainage are discussed in their relation to the existence of weeds and also to their effect



on the bacterial flora and the physical condition of the soil. The necessity of regulating the systems of husbandry according to climate, as well as to soil type is established. In the control of soil fertility the treatise gives simple but useful rules for the guidance of a farmer in the choice of crops, the methods of cultivation and kind of fertilizers to use.—*H. N. Vinall.*

1106. SCHERFFIUS, W. H. **Cotton. The promise of a great industry.** Jour. Dept. Agric. Union South Africa 8: 145-151. 3 fig. 1924.—The condition and prospects of the cotton industry in South Africa are discussed. The world's demand calls for new cotton lands, and South Africa possesses an abundance of suitable, cheap land, of climate and of labor.—*L. I. Goldblatt.*

1107. SCHERFFIUS, W. H. **Tobacco growing in South Africa. Good prospects of a paying industry.** Jour. Dept. Agric. Union South Africa 8: 152-155. 4 fig. 1924.—The tobacco industry is discussed. The potentialities of this industry in South Africa are very great, for the huge areas suited to tobacco culture may be estimated by the hundreds of thousands of acres.—*L. I. Goldblatt.*

1108. SCOTLAND. BOARD OF AGRICULTURE. **List of names of the varieties of the potato known to have been grown or tested in Great Britain, together with their synonyms.** Misc. Publ. 4. 1-50. Board of Agric. Scotland: Edinburgh, 1924.—This list was prepared for the purpose of placing on record as complete a list as possible of varieties of potatoes grown commercially or otherwise in Great Britain.—*W. Stuart.*

1109. SEWELL, M. C. **Relation of the molecular proportions of the nutrient solution to the growth of wheat.** Jour. Agric. Res. 28: 387-393. 4 fig. 1924.—In a salt nutrition study of wheat extending over 3 periods of growth,  $\text{KH}_2\text{PO}_4$ ,  $\text{Ca}(\text{NO}_3)_2$ , and  $\text{MgSO}_4$  were used in 21 molecular proportions in solutions of equal osmotic concentration. The periods of growth consisted of the seedling, vegetative and fruiting phases. During the fruiting phase, the several solutions outstanding in grain production included one having a high molecular proportion of the N salt compared with the PK salt, and vice versa. The results emphasize the importance of N in the development of the wheat plant.—*Author.*

1110. SKAIFE, L. H. **Maize culture.** South African Fruit Grower 11: 83-85. 1924.—The cultivation of maize is discussed.—*L. I. Goldblatt.*

1111. SPEIGHT, JOHN. **Why not a creaseless wheat?** National Miller 29<sup>8</sup>: 25-26. 1924.—The writer points out that the presence of the crease in the wheat kernel has caused the invention of the purifier and finally of the roller process of milling. If a wheat with creaseless kernels can be developed he predicts another revolution in milling methods and suggests the possibility of chemical methods of removing bran and extracting starch.—*Carleton R. Ball.*

1112. STELLA, L. M. **The Turkish tobacco industry in Asia Minor and Macedonia.** Jour. Dept. Agric. Union South Africa 8: 388-407. 5 fig. 1924.—This is a report on the tobacco industry in the various tobacco growing districts of Asia Minor and Macedonia. The procedure of the different companies in regard to the buying, preparing, fermenting, sorting, etc., of the leaf and the conditions prevailing in the different districts are discussed, together with climatic conditions, flavor, cultural methods, types of tobacco, markets, and these are compared with the circumstances prevailing in South Africa.—*L. I. Goldblatt.*

1113. STOCKDALE, F. A. **The treatment of weeds in permanent crops.** Jour. Bd. Agric. British Guiana. 17: 55-60. 1924.—This paper is a discussion of the control of weeds in such crops as cacao, coffee, oranges, limes, and rubber. In planting a large number of permanent crops it is a common practice to interplant with temporary crops such as bananas, plantains, cassava, etc., in order that some returns may be obtained during the 1st few years of growth. Different methods for weed control are as follows: (1) Clean-weeding either by constant use of the fork and hoe or by means of the hoe alone; (2) clean-weeding and cutlassing—clean-weeding a circle around each tree, and cutlassing down the weeds between trees at definite intervals; (3) cutlassing—cutting weeds periodically with a cutlass and either using the weeds as a mulch around the trees or allowing them to remain where cut; (4) green mulching—growing "smother crops" to kill out the weeds, cutlassing them down periodically and allowing them to rot on the ground.—*J. P. Jones.*

1114. STRONG, H. M. **Relation between value and volume of agricultural exports.** Trade Inform. Bull. 271. 1-77. Fig. 1-23. Government printing office: Washington, D. C., 1924.



1115. SUTTON, G. L. Pedigree selection of seed at the Chapman and Merridin Experiment Farms. Jour. and Proc. Roy. Soc. Western Australia 8: 17-25. Illus. 1922; Western Australia Dept. Agric. Bull. 105. 1-11. Illus. 1923.—The method employed is completely outlined.—*Wm. Randolph Taylor*.

1116. SUTTON, G. L. The absorption of moisture by wheat grain and its relation to the humidity of the atmosphere. Jour. and Proc. Roy. Soc. Western Australia 6: 75-87. 1920.—Wheat grain increases in weight during the wet winter months and decreases during the dry months, but the decrease does not bring the weight back to that of freshly harvested wheat.—*Wm. Randolph Taylor*.

1117. TAYLOR, H. W. Illustrations of correct tobacco culture. Rhodesia Agric. Jour. 21: 179. Pl. 1-8. 1924.—This is a series of photographs illustrating the correct means of tobacco culture from the seed bed to the topping stage.—*L. I. Goldblatt*.

1118. TERASAWA, YASUHISA. On the cutting of potato tubers. (Japanese.) Jour. Sci. Agric. Soc. 221: 115-139. 2 fig. 1921.—In a series of experiments on potato tubers the author has found that the eyes grow much more rapidly when the tubers are cut into a number of pieces than when they are left intact. In intact tubers the eyes near their summit develop at first, while other either develop much later or even remain quite undeveloped. That this fact is due to the physiological correlation prevailing among them has been proved by cutting a tuber into a number of transverse pieces, inasmuch as then the eyes on all pieces develop with almost equal rapidity. The author has also proved experimentally that  $O_2$  is quite necessary for the development of eyes, because within a closed receptacle devoid of  $O_2$  they remain undeveloped and finally die.—*Author*. (Courtesy Japanese Jour. Bot.)

1119. THORNTON, W. R. The export of lucerne. Jour. Dept. Agric. Union South Africa 8: 286-290. 2 fig. 1924.—The article deals with the preparation of lucerne for export purposes. Items discussed are the packing and compressing of lucerne hay, lucerne meal, lucerne seed, and the costs of marketing.—*L. I. Goldblatt*.

1120. TODD, JOHN A. The world's cotton crops. xv + 460 p. Pl. 1-32, maps 1-10, 6 diagr. A. & C. Black, Ltd.: London, 1923.—"The aim of the book is to give . . . an account of the sources of supply of raw cotton, in a form sufficiently non-technical to be understood alike by the average grower and consumer . . . a list of the publications, reports, etc., on which each chapter is founded is given at the end of the chapter."—After an introductory chapter the subject is discussed under the following main headings: The cotton plant; geographical distribution of cotton; India; China, Japan, and Indo-China; Russia, Persia, and Asia Minor; The United States, Mexico, etc.; price of American cotton; British West Africa; East and South-East Africa; other African Colonies; South America; Long Staple American Upland; Egypt; Anglo-Egyptian Sudan; Sea Island Cotton; Oceania, etc.; uses of cotton and of cotton seed; and effects of the war.—Under geographical headings such local phases of the subject are taken up as history of cotton culture, methods of growing, production and consumption, pests, etc.—A statistical appendix follows.—*Frederick V. Rand*.

1121. TORRES, J. P. Some notes on rice hybridization work. Philippine Agric. Rev. 16: 46-48. 1923.—The technique of hybridizing rice is briefly outlined and notes on labeling and seed preservation are given.—*H. M. Steece*.

1122. WALDRON, L. R. A new durum wheat, Nodak. Dakota Farmer 43: 458. 1923.—Nodak durum wheat, a selection from Kubanka developed by the North Dakota Exp. Sta. in cooperation with the U. S. Dept. of Agric. is described as rust resistant, comparatively high yielding, and promising to be satisfactory for macaroni.—*H. M. Steece*.

1123. WATKINS, W. R. Farmers' experiment plots. Potato trials, 1923-24. The Dorrigo Plateau. Agric. Gaz. New South Wales 35: 629-630. 1924.—Twenty varieties were grown upon a private farm. The maximum yield of 233 bushels was secured from the variety Langworthy. Application of superphosphate gave increased yields.—*L. R. Waldron*.

1124. WELLINGTON, J. H. Some geographical factors affecting agriculture in South Africa. South African Geog. Jour. 6: 41-66. 1923.—South Africa consists of an extensive plateau region bordered by a coastal strip of varying width and diverse structure. The mountain ranges trending north and south, and east and west in the coastal region form definite climatic barriers to their hinterlands. South Africa forms the peninsular end of a continent



and is traversed by a tropical belt of high pressure. In winter when the land mass is cool this high pressure belt is continuous from the Atlantic to the Indian Ocean, but in the summer the land becomes hot so that the tropical high pressure belt is somewhat modified by the southward extension of the equatorial low pressure system. The mean annual temperature of the west coast at Port Moloth is 57°F. while on the east coast at Durban it is 70°F. In the south coastal region the Mosambique Current has its effect on the climate. The diurnal range of temperature is greater on the plateau than in the coastal region and killing frosts are not infrequent in critical months over most of the plateau region. The average annual rainfall varies from 35 inches on the east coast to 5 inches on the west. There is, however, a narrow strip along the seacoast on the south where the rainfall is from 15 to 25 inches. The eastern  $\frac{3}{4}$  of South Africa has a summer rainfall while the west coast has a winter rainfall. Evaporation and surface flow or run-off are high. According to the European and American methods of classifying soils there are 6 soil groups, "Brown Desert," "Chestnut Brown," "Tchernozom," "Natal Loam," "Prairie Soils," and "Brown Soils of Cape Province." The Tchernozom, Chestnut Brown, Prairie soils and Natal Loams are the most productive. Irrigation is possible in some parts where the river systems lend themselves to the construction of storage reservoirs. Maize, wheat and sorghum are the principal crops. Sugar cane and cotton may be grown in a limited way on the low veld and coastal strip of the Transvaal and Natal. Geographical conditions of South Africa are on the whole more favorable to livestock farming than to crop production.—A short list of valuable references is given.—*H. N. Vinall.*

1125. WISE, F. B. **Effects of variety diversification.** *Rice Jour.* 26: 11-12. 1923.—Suitable allotment of the farm acreage to proper rice varieties with different times of maturity is pointed out as a means for permitting gradual planting, irrigation, and harvest, using labor and equipment more economically, and marketing a better product.—*H. M. Steece.*

1126. WRIGHT, P. A., AND R. H. SHAW. **A study of ensiling a mixture of Sudan grass with a legume.** *Jour. Agric. Res.* 28: 255-259. 1924.—Experimental silos were filled with Sudan grass, soybeans and cowpeas alone and with mixtures of Sudan grass and soybeans, and Sudan grass and cowpeas. The silages were examined for keeping quality, palatability, chemical composition and loss in feed constituents. From this study the author concludes that it is not necessary for the production of good silage to ensile a mixture of a crop high in protein with one high in carbohydrates. The crop carrying a large percentage of carbohydrates will usually take care of itself in the silo; and the high protein crop, if wilted so as to contain the proper moisture content, will also produce a satisfactory silage.—*P. A. Wright.*

1127. ZIELSTORFF, W. **Vergleichende Konservierungsversuche im Elektro- und Deutschen Futterturm.** [Comparative experiments on ensiling in Electro and German silos.] *Mitteil. Deutsch. Landw. Ges.* 39: 637-638. 1924.—Green serradella was ensiled toward the end of November, samples being placed in nets at various levels and later recovered and analysed. The results showed no material difference between the 2 methods. Feeding experiments confirmed this conclusion.—*A. J. Pieters.*

## BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

CARROLL W. DODGE, *Editor*

CHARLES A. WEATHERBY, *Assistant Editor*

(See also in this issue Entries 1246, 1268, 1303, 1334, 1491, 1596, 1756, 1766, 2103)

1128. ANONYMOUS. **Death of a great sugar scientist.** Dr. William C. Stubbs. *South African Sugar Jour.* 8: 589. 1924.—A brief appreciation and account of Doctor Stubbs life and work are given with The Louisiana Planters' biographical article on this widely mourned journalist, educator, scientist, and authority in the sugar industry.—*Nellie E. Fealy.*

1129. ANONYMOUS. **Third Pan-American Scientific Congress.** *Phytopathology* 14: 401. 1924.—This is a notice of the 3rd Pan-American Scientific Congress at Lima, Peru, November 16-30, 1924.—*B. B. Higgins.*

1130. BRIQUET, J. **Notice biographique sur Charles Bader (1836-1919).** *Ann. Conservatoire et Jard. Bot. Genève* 21: 339-345. *Portrait.* 1920.



1131. BRIQUET, J. Notice sur la vie et les travaux botaniques de Auguste Schmidely (1838-1918). [Notice on the life and botanical works of Auguste Schmidely (1838-1918).] Ann. Conservatoire et Jard. Bot. Genève 21: 323-337. *Portrait*. 1920.—To the biographical sketch is appended a list of publications, of exsiccatae, and of the collectors and exsiccatae in the herbarium.—A. S. Hitchcock.

1132. BRIQUET, J. Notice sur la vie et les travaux botaniques de Paul Chenevard. [Notice on the life and the botanical works of Paul Chenevard.] Ann. Conservatoire et Jard. Bot. Genève 21: 457-472. *Portrait*. 1922.—A biographical sketch and a list of publications is given.—A. S. Hitchcock.

1133. BRIQUET, J. Rapport sur l'activité au Conservatoire et au Jardin botaniques de Genève pendant les années 1919, 1920 et 1921. [Report on the activity of the conservatory and the botanical garden of Geneva during the years 1919, 1920 and 1921.] Ann. Conservatoire et Jard. Bot. Genève 21: 481-515. 1922.—The report includes statements concerning the Delessert Herbarium, the herbarium and library of Burnat, the herbarium and library of DeCandolle recently acquired, the general library, and the botanical garden.—A. S. Hitchcock.

1134. COLLINS, JAMES H. Lue Gim Gong. *Citrus Indust.* 5: 26, 38. 1924.—This is an account, from "Farm and Fireside," of the work and life of Lue Gim Gong, a Chinese horticulturist noted for his plant breeding work in Florida. His most outstanding achievement is the Lue Gim Gong orange, thousands of acres of which have been planted in Florida.—Arthur S. Rhoads.

1135. CORRENS, C. Richard Wettstein-Westerheim zu seinem sechzigsten Geburtstage. [Richard Wettstein-Westerheim, his sixtieth birthday.] *Naturwissenschaften* 11: 509-512. 1923.—On the 30th of June, Richard Wettstein celebrated his 60th birthday. Correns reviews Wettstein's contributions in the fields of systematic botany, of plant geography and of phylogeny. From his monographic studies on *Gentiana*, *Euphrasia*, and *Sempervivum* (the last not yet published), Wettstein was led to put forward certain theories regarding geographical distribution, the origin of species, and the causes of seasonal dimorphism. His interest in phylogenetic questions led to the "Handbuch der systematischen Botanik" whose system of classification is discussed along with the views of its author in regard to the significance of alternation and the origin of the angiosperms.—R. E. Torrey.

1136. CRATTY, R. I. Dr. Rudolph Gmelin and his collection of Minnesota, Wisconsin and Iowa plants. *Proc. Iowa Acad. Sci.* 28: 248-255. *Pl.* 9. 1921 [1923].—This is a 2-page biography of Rudolph Gmelin, and a list of 269 species collected by him, with localities. The collection was made between 1874 and 1894 and is now in the herbarium of the Iowa State College at Ames.—H. S. Conard.

1137. GAGE, EARLE W. The ancient avocado groves of Guatemala. *Amer. Fruit Grower* 43: 8, 24. *Illus.* 1923.

1138. GALINDO Y VILLA, JESUS. Jardines botánicos de Anáhuac. [Botanic gardens of Anahuac.] *México Forest.* 2: 13-14: 15-16. 1924.—The Nahuas and other Mexican peoples established many botanic gardens for the cultivation of medicinal and ornamental plants. Flowers were extensively used on ceremonial and festive occasions.—W. N. Sparhawk.

1139. JUMELLE, H. L'oeuvre scientifique de Gaston Bonnier. [The scientific work of Gaston Bonnier.] *Rev. Gén. Bot.* 36: 289-307. 1924.

1140. LEÓN, HERMANDO. Las exploraciones botánicas de Cuba. [Botanical explorations in Cuba.] *Mem. Soc. Cubana Hist. Nat.* "Felipe Poe" 3: 178-224 (Reprint, p. 1-47). *Portrait*, 1 map. Habana, Cuba, 1918.—This is a general review of the botanical explorations in Cuba from the earliest times to 1917, with references to published reports and herbarium depositories of the various collectors.—J. A. Faris.

1141. MERRILL, E. D. Bibliography of Polynesian botany. *Bernice P. Bishop Mus. Bull.* 13. 1-68. 1924.—"Polynesia as delimited for the purpose of preparing an index to its flora and for the present bibliography, includes all the islands in the Pacific Ocean lying between the Tropic of Cancer (including Hawaii) and latitude approximately 30 degrees south. . . . In general only those papers have been included which contain direct references to Polynesia. . . . It is fully realized that many of the general works that do not apply specifically to Polynesia are of greater value and more importance than are many of the titles having Poly-

nesian references that have been admitted in this bibliography. . . . Comparatively little attention has been given to the special literature covering the lower groups of plants, such as the fungi, lichens, hepatics, and mosses. . . . For all these groups a special literature has been built up. . . ."—The bibliographic portion of the work covers 61 pages of titles arranged alphabetically by authors. [See also Bot. Absts. 11, Entry 3553; 12, Entries 885, 6116.]—*Frederick V. Rand.*

1142. MURRILL, W. A. Dr. Carlos Spegazzini. *Mycologia* 16: 200-201. 1924.—The author describes a day spent with Carlos Spegazzini, and gives a few notes on his work and collections, and on the fungi observed in the vicinity.—*G. R. Bisby.*

1143. RAMSBOTTOM, J. Henry Cusack Wingfield Hawley (1876-1923). *Trans. British Mycol. Soc.* 9: 241-243. 1923.—The subject of this paper served as a captain throughout the world war and until May 1919. He was an authority on Pyrenomycetes and for some time previous to his death had been working on a monograph of this group of fungi. His specimens, manuscripts, and drawings have been presented by Lady Hawley to the British National Herbarium.—*W. B. McDougall.*

1144. ROACH, B. S. Ferdinand von Mueller. *South Australian Nat.* 3: 76-82. 1921.

1145. ROACH, B. S. George Bentham, author of *Flora Australiasis*. *South Australian Nat.* 2: 30-34. 1921.

1146. R[OACH], B. S. The founder of South Australian botany, Robert Brown. *South Australian Nat.* 1: 37-41. 1920.

1147. SAMPAIO, A. J. DE. *Bibliographia botanica (relativa á flora brasileira, com inclusão dos trabalhos indispensaveis aos estudos botanicos no Brasil)*. [Botanical bibliography relating to the flora of Brazil.] *Bol. Mus. Nacion. Rio de Janeiro* 1: 111-125, 225-245. 1924.—These instalments contain citations from a bibliography being compiled by the Botanical Section of the Rio de Janeiro Museum, to include publications necessary or useful to students of the flora of Brazil.—*Edith K. Cash.*

1148. SERPIERI, A. [Rev. of: RICCI, FRANCESCO. *Socialismo e libertà forestale*. (Socialism and forest freedom.) *Tipografia Editrice Romana*: Rome, 1921]. *L'Alpe*. 2nd Ser. 9: 244-247. 1922.

1149. TOEPPFER, ADOLPH. Johann David Schöppf, a pioneer of American botanical exploration. *Torreyia* 24: 57-58. 1924.—Schöppf was born March 8, 1752, at Wunsiedel in Bavaria. He studied medicine at the University of Erlangen, and in 1777 accompanied a regiment of Bavarian soldiers to America as an army physician. While connected with an army hospital in New York, he studied the plants of the vicinity, and planned a *Flora of the State of New York*. The incomplete manuscript has recently come to light, describing in Latin some 790 species of phanerogams and 105 species of cryptogams, arranged according to the Linnean system. After the war he travelled through the southern U. S. A. and the Bahamas, returning to Europe in 1784, where he became court physician at Bayreuth, and published in 1787 his only botanical work, the *Materia Medica Americana*.—*J. C. Nelson.*

## BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entries 1180, 1219, 1321, 1356, 1415, 1953, 1993, 2072)

1150. ANONYMOUS. Imperial College of Tropical Agriculture. *South African Sugar Jour.* 8: 605. 1924.—In order to emphasize the Imperial nature of the institution its name was changed from The West Indian College of Tropical Agriculture to that named above. The objects of the college are set forth, its environs described, and the advantages to the students from important features of the environment enumerated.—*Nellie E. Fealy.*

1151. ARTHUR, ELIZABETH E. *Practical laboratory methods and histologic technic*. iii + 93 p. F. A. Davis Co.: Philadelphia, 1924.—This is interleaved for notes, and compiled for students' use.—*A. H. Graves.*



1152. BEAN, RALPH C. Some popular misconceptions. *Maine Nat.* 4: 83-85. 1924.—The beginner in botany commonly has no idea of botanical geography; the author once spent much time searching for pyxie in central Maine. From pictures, he supposed *Isoetes* was a plant resembling a large sedge. Goldenrod is considered a sign of autumn, but one species, *Solidago juncea*, regularly blossoms in July. Deep woods are not the best collecting places. English names are often misleading as to relationships.—C. A. Weatherby.

1153. BERRY, JAMES BERTHOLD. Southern woodland trees; a guide to the identification of trees and woods to accompany Farm Woodlands; a handbook for students, teachers, farmers and woodsmen. viii + 214 p. *Illus.* World Book Co.: Yonkers and Chicago, 1924.

1154. BRIQUET, J. Caractères résumés des principaux groupes de formations végétales étudiés dans un cours de géographie botanique. [A review of the characters of the principal group of plant formations studied in a course in botanical geography.] *Ann. Conservatoire et Jard. Bot. Genève* 21: 389-404. 1920.—Thirty terms are defined and discussed, such as pluvisilves (rain-forests), and marshes, (salt-meadows).—A. S. Hitchcock.

1155. CHAMBERLAIN, CHARLES J. Methods in plant histology. 4th rev. ed. xi + 349 p. 118 fig. The University of Chicago Press: Chicago, 1924.—“While the chapter headings and general arrangement remain about the same as before, the book has been almost entirely re-written.—Directions for collecting material have been amplified and the preparation of the most familiar laboratory types has received particular attention. While no radical changes have been made in the paraffin method, the process has been shortened and improved; the Venetian turpentine method, introduced in the second edition and improved in the third, has come into such general use that the experience of many laboratories has been added to that of our own, and the directions have become so definite that there is little excuse for failures. The cellulose acetate method, which may do as much for woody structures as the Venetian turpentine method has done for its class of mounts, is outlined in a tentative way, and the chapter on ‘Photomicrographs and Lantern Slides’ has been extended and improved.—The introduction of American stains, which are becoming very accurately standardized, has occasioned some modifications throughout.”—The 29 chapters deal with the following subjects: Apparatus, reagents, stains and staining, general remarks on staining, temporary mounts and microchemical tests, freehand sections; the glycerin, Venetian turpentine, paraffin, celloidin, cellulose acetate, and special methods; photomicrographs and lantern slides; chapters on specific directions for specific plant groups from slime molds and bacteria up through the flowering plants; use of the microscope, labeling and cataloguing preparations, class list of preparations, formulas for reagents, and bibliography.—Frederick V. Rand.

1156. CLEMENT, ARTHUR G. Living things, an elementary biology. viii + 488 p. *Illus.* The Iroquois Publishing Co. Inc.: Syracuse, N. Y., 1924.

1157. CLUTE, WILLARD N. Plant names and their meanings.—XX. Malvaceae. *Amer. Bot.* 30: 103-109. 1924.

1158. CLUTE, WILLARD N. Practical plant protection. *Illinois Acad. Sci. Trans.* 16: 67-73. 1923.—Attention is called to the destruction of wild flowers in the natural development of a country. Many beautiful flowers do not need protection and may be picked in any quantity without fear of extermination. Certain groups of plants, however, do need protection partly on account of their habitat and partly because of their popularity. The early spring flowers are especially subject to raids by flower pickers. A practical method of protecting flowers which need protection is suggested. Adequate state laws should be passed and enforced, and certain sanctuaries set aside with proper guards. Educating the public as to what flowers may be gathered and what ones left would aid greatly in maintaining the wild flora.—H. W. Anderson.

1159. GEHRS, JOHN H. Soils and crops. viii + 444 p. *Illus.* The Macmillan Co.: New York, 1924.

1160. GRAVES, ARTHUR HARMOUNT. Some common horticultural questions I. When and how to transplant trees and shrubs: winter care of dahlias and cannas. *Brooklyn Bot. Gard. Leaflets* 12<sup>10</sup>: 1-4. 1924.—This is the 1st of a series in which answers are printed to questions commonly asked at the Brooklyn Botanic Garden by the general public.—Author.

1161. GUNDERSSEN, ALFRED. Trees of the Brooklyn Botanic Garden and Prospect Park.

Brooklyn Bot. Gard. Leaflets 12<sup>8-9</sup>: 1-8. 1924.—A list of trees is here given, arranged by families, with their scientific and common names, their heights and ranges, respectively, growing in the Brooklyn Botanic Garden and in Prospect Park.—*A. H. Graves.*

1162. HEUSER, EMIL. *Textbook of cellulose chemistry*. [Translation from the German of the 2d ed. by CLARENCE J. WEST and GUSTAVUS J. ESSELEN.] 1st ed. xi + 212 p. McGraw-Hill Book Co.: New York & London, 1924. [See Bot. Absts. 11, Entry 3038.]—As stated on the title page, this book is designed for students in technical schools and universities as well as for cellulose experts. The chapters are as follows: (1) cellulose alcoholates; (2) cellulose esters; (3) cellulose ethers; (4) the oxidation of cellulose; (5) degradation of cellulose; (6) constitution of cellulose.—*A. H. Graves.*

1163. HOLMAN, RICHARD M., AND WILFRED W. ROBBINS. *A textbook of general botany for colleges and universities*. ix + 590 p. Fig. 374. John Wiley & Sons., Inc.: New York, 1924.—This text is designed for use in connection with a year's course that includes laboratory work and demonstrations. An outline of the contents is placed at the beginning of each of the 16 chapters. The chapter headings are: Part I (physiology and morphology of seed plants); introduction; the plant as a whole; the cell; the stem; the root; the leaf; the flower; fruit, seed, and seed germination; summary;—Part II (special morphology, physiology, and evolution of the principal groups of plants); introduction; thallophytes (algae); thallophytes (fungi); the Bryophyta (liverworts and mosses); Pteridophyta (ferns and fern allies); the Spermatophyta; evolution and heredity.—*C. S. Gager.*

1164. McCUBBIN, W. A. *Fungi and human affairs*. vii + 111 p. 1 pl., fig. 1-46. World Book Co.: New York, Chicago, 1924.—". . . this volume, while giving great prominence to the question of plant diseases, has been broadened to bring out such fundamental realities as the source of the world's carbon food, the relation of green plants, animals, and human beings to this source, and . . . the beneficial work performed by fungi and bacteria in restoring carbon dioxide to the air, as well as questions of wood rots, food preservation, and plant diseases. . . . It is the author's conviction that if proper material and methods are employed the average public school pupil can come to a simple understanding of these fundamental relationships. . . ." The subject matter is discussed under the following subject headings: The world's carbon supply, the nature of fungi, bacteria, fungi useful to mankind, edible fungi, wood rots, food preservation, plant diseases.—A list of 50 questions and answers is appended.—*Frederick V. Rand.*

1165. MYERS, CHARLES EVERETT. *Effectiveness of vocational education in agriculture; a study of the value of vocational instruction in agriculture in secondary schools as indicated by the occupational distribution of farmer students*. U. S. Federal Board for Vocational Education Bull. 82. v + 63 p. 11 diagr. Govt. Printing Office: Washington, 1924.—From a study of the data collected from 37 states, some of the conclusions are: (1) From 60-75% of the students given vocational instruction in agriculture are now in agricultural work. (2) The vocational classes in agriculture in the States of New York and Pennsylvania are sending 10-20 times as large a proportion of their students directly into farming as do the academic high schools. (3) The number of students going out annually from the secondary schools with vocational instruction in agriculture has increased tenfold since the passage of the Federal Vocational Education (Smith-Hughes) Act. In 1917 the number reported was 297; in 1921, 2,912.—*A. H. Graves.*

1166. PAMMEL, L. H. *The teaching of plant pathology*. Proc. Iowa Acad. Sci. 28: 263-264. 1921 [1923].—Plant pathology presupposes a good foundation in general botany, including morphology and histology of flowering plants, and a brief study of algae and fungi. Gross and microscopic studies, pure cultures, and inoculations should be used in the pathology course.—*H. S. Conard.*

1167. RANGACHARI, K. *Practical botany*. 114 p. 35 fig. Gov. Press: Madras, 1923.—The exercises are based on the author's Manual of Elementary Botany for India [see Bot. Absts. 11, Entry 3454]. Section I is devoted to morphology and histology of flowering plants, and plant types for 48 families are listed for description and study. Directions are given in section II for class experiments in physiology. Section III deals with cryptogams and includes most of the types. The appendices contain information on apparatus required for



ordinary botanical work, the microscope and its use, the making of preparations, and the reagents in common use. Of the 35 figures in the text 20 are from microphotographs.—*P. S. Jivanna Rao*.

1168. ROBBINS, WILFRED W. *The botany of crop plants*. 2nd ed. xxi + 674 p. Fig. 263. P. Blakiston's Son & Co.: Philadelphia, 1924.—This edition is revised with the aim of bringing the text up to date with reference to contributions to our knowledge of crop plants made since the 1st edition was issued. A few new illustrations have been added.—*C. S. Gager*.

1169. SCHAFFNER, J. H. *Principles of plant taxonomy*. I. Ohio Jour. Sci. 24: 146-160. 1924.—Plants are divided into 7 subkingdoms based on the changes in the relation of the sexual state to the life cycle: Protophyta (asexual thallophytes), Nematophyta (sexual thallophytes), Bryophyta, Pteridophyta Homosporae, Pteridophyta Heterosporae, Gymnospermae, and Angiospermae. The importance of class and species is discussed.—*H. D. Hooker, Jr.*

1170. SHIMEK, B. *The use of common names for plants*. Proc. Iowa Acad. Sci. 28: 225-229. 1921 [1923].—The use of scientific names is urged because they are universal, accurate and specific. "The use of common names will continue, but those who use them should join in some effort at standardization. To bring about this standardization of common names will require the combined efforts of all who are interested. . . . Two ways of reaching this result are here suggested: (1) Restore systematic plant study in our high schools. . . . (2) Encourage the amateur study of local plants."—*H. S. Conard*.

1171. SKENE, MACGREGOR. *The biology of flowering plants*. xi + 523 p. Pl. 1-8, fig. 1-68. The Macmillan Co.: New York, 1924.—"This book is an attempt to give an account of the way in which the flowering plant lives, especially in relation to its environment. This, it might be said, is the aim of *ecology*; but *ecology* approaches the plant as a member of a community, while *biology*, as it is understood here, is interested rather in the plant as an individual. . . . The difficulty of giving enough to make the foundation sound, yet not so much as to obscure the picture, has been fully realized, though perhaps not overcome."—The 6 chapters take up, respectively, the following main phases of the subject: The absorption of H<sub>2</sub>O and salts; assimilation and transpiration; special modes of nutrition (including parasites, saprophytes, mycotrophic plants, bacterial symbiosis and insectivorous plants); mechanical problems, protection; reproduction and dispersal; and development. An extensive bibliography and indexes of plant names and subjects are appended.—*Frederick V. Rand*.

1172. SMITH, GILBERT M., JAMES B. OVERTON, EDWARD M. GILBERT, ROLLIN H. DENNIS-TON, GEORGE S. BRYAN, and CHARLES E. ALLEN. *A textbook of general botany*. x + 409 p., 321 fig. The Macmillan Co.: New York, 1924.—In this book, intended for an elementary course for the first year of college, botany is presented as a unit, without defining "the artificially abstracted phases of the subject—morphology, physiology, ecology, and the like—distinctions which have their place in defining and limiting the scope of more advanced and special courses." The 1st 12 chapters are devoted to a general consideration of structure and function of the vegetative organs of the higher plants; chapters 13-29 treat of the groups of plants from algae and bacteria to and including seed plants, with a chapter on the reduction of chromosomes following that on mosses and preceding the one on ferns; chapters follow on seeds and fruits, inheritance and variation, evolution, the geographic distribution of plants in North America, and the economic significance of plants. Under the last heading are included crop plants, plants used in medicine, forestry and forest products, weeds and plant diseases.—*A. H. Graves*.

1173. SPRATT, E. R. *Chemistry and physics for botany students*. 196 p. 63 fig. Univ. Tutorial Press Ltd.: London, 1923.—This book treats of the elementary principles of chemistry and physics, and describes numerous simple experiments in these sciences. It is designed as a preparatory study for those who are to begin the study of elementary botany.—*A. H. Graves*.

1174. THORNTON, R. W. *Agricultural education in South Africa. The universities and schools of agriculture*. Jour. Dept. Agric. Union South Africa 8: 117-128. 5 pl. 1923.—There are 2 universities of South Africa having faculties of agriculture, and 5 schools of agriculture. These institutions are geographically situated, so as to serve definite objects applicable to the climatic conditions prevailing in their respective areas. A short sketch of the

growth of agricultural research and education in South Africa is given, and a description of each of the 5 schools, their situation, value, courses of instruction, etc. The officers of these institutions, who are government officials, are brought into close contact with the farmer, visiting farms and giving advice, attending agricultural shows, etc. The short vacation courses of 5-10 days, on specialized subjects, are becoming an extremely popular feature.—*L. I. Goldblatt.*

1175. WATERS, HENRY JACKSON. *Essentials of the new agriculture.* viii + 549 p. *Illus.* Ginn & Co.: New York, 1924.

1176. WESLEY, WILLIAM M. A novel and economic method of making charts for science instruction. *Illinois Acad. Sci. Trans.* 16: 43-45. 1 pl. 1923.—A modified delinescope is used to project opaque objects on a blank surface of a chart where they may be outlined and details filled in later with ink or colors.—*H. W. Anderson.*

## CYTOLOGY

GILBERT M. SMITH, *Editor*

(See also in this issue Entries 1353, 1359, 1398, 1447, 1496, 1541, 1933, 1949, 1950)

1177. BOWER, F. O. The primitive spindle as a fundamental feature in the embryology of plants. *Proc. Roy. Soc. Edinburgh.* 43: 1-36. *Fig. 1-26.* 1922.—The earliest shape assumed by embryonic plants is some modification of the spindle. In many of lowest algae no polarity is expressed, but with other algae and all plants above the Thallophyta a definite polarity is manifested. This is determined by the 1st mitotic figure. Factors determining orientation are: pressure of surrounding gametophyte tissue, applicable primarily in Archegoniates; direction of source of food supply; incidence of light; direction of gravity; and solid substratum, applicable in free living algae.—Two types of polarity are distinguished: (1) exoscopic, in which base and apex of embryo coincide in direction with base and apex of archegonium; and (2) endoscopic, in which the reverse is true. The former is found primarily among the bryophytes and the latter among lycopods, primitive suspensor-bearing Filicineae, and all spermatophytes. An intermediate condition is found among suspensorless leptosporangiates. The fact that the orientation of the embryo remains the same with reference to the axis of the archegonium regardless of the direction of the archegonium in nature, indicates that the source of food supply, and not gravity, is the controlling factor. In liverworts and bryales the early divisions of the zygote are transverse producing a spindle-shaped embryo. In the suspensor-bearing pteridophytes the 2- and 3-celled embryos are true spindle forms. Where the suspensor is lacking the spindle shaped embryo continues only through the 2-celled stage and the polarity is intermediate between the exoscopic and the endoscopic. Endoscopic growth is of advantage in downward pointing archegonia only where the embryo may continue to grow vertically through the tissue of the prothallium. In other cases various degrees of curvature are necessary to permit the embryo to assume an erect position. The embryos of homosporous leptosporangiates and a few heterosporous forms have lost their suspensor, show the intermediate polarity, and avoid these compensating curvatures.—*Ray C. Friesner.*

1178. CASTETTER, E. F. Studies on the cytology of *Melilotus alba*. (Abstract.) *Proc. Iowa Acad. Sci.* 30: 331. 1923 [1924].—Development of pollen follows the usual plan in angiosperms. There are 8 chromosomes in the gametophyte. Each pollen mother cell forms 4 normal pollen grains, each with 3 germ pores.—*H. S. Conard.*

1179. CLELAND, RALPH E. Meiosis in pollen mother cells of *Oenothera franciscana sulfurea*. *Bot. Gaz.* 77: 149-170. *Pl. 14-15.* 1924.—All stages of the heterotypic and homoeotypic divisions are described in detail, agreeing in many respects with those previously described by the author for *Oenothera franciscana* (see *Bot. Absts.* 12, Entry 182). Both plants show telosynapsis, *O. franciscana sulfurea* showing it even more clearly than *O. franciscana*. In the present paper the synzesis stages of the former are described in detail. The chromatin contents of the nucleolus pass into the reticulum by way of 1 or 2 prominent threads which attach the nucleolus to the spireme. When the nucleolus is emptied the endonucleolus becomes visible. The resulting spireme is a densely tangled mass throughout the open spireme



stage. No indications of parallel threads or of a longitudinal splitting were observed. During the 2nd contraction period all threads begin to contract at the center and at the same time the peripheral parts are thrown into prominent loops whose identity can generally be traced throughout the contraction period. These loops, as the contraction knot unfolds, are found to be a part of a long chain of 12 chromosomes attached end to end to form a closed circle, and a pair of chromosomes at first linked around the larger chain but later becoming separated. The circle of 12 chromosomes remains unbroken while the nuclear membrane disappears, then is brought to the equatorial plate of a multipolar spindle which later becomes bipolar. Alternate chromosomes pass to the same pole. The remaining pair of chromosomes behaves in the usual manner. All chromosomes retain their identity during interkinesis. A longitudinal splitting occurs when the chromosomes have lost all contact with one another, and the 2 halves twist apart at right angles so that each forms a maltese cross. Nucleoli are developed de novo, and the daughter nuclei pass through the homeotypic mitosis simultaneously. The constant grouping of the chromosomes in late prophase into 2 groups of 12 and 2, respectively, as well as the generally normal distribution in the 1st anaphase, suggests the possibility that chromosomes have definite positions in nuclei. The failure of all but 1 pair of homologous chromosomes to actually pair in diakinesis suggests the possibility that *O. franciscana* *O. sulfurea* is largely heterozygous.—Wanda Weniger.

1180. COWDRY, EDMUND VINCENT. (Editor) *General cytology. A textbook of cellular structure and function for students of biology and medicine.* vii + 754 p. 9 pl., 172 fig. Univ. Chicago Press: Chicago, 1924. This is a series of essays on cytological topics, treating, with few exceptions, of phenomena observed in metazoa. Following an introduction by E. B. WILSON, the topics treated are: chemistry of cells (A. P. MATHEWS); permeability of the cell (M. H. JACOBS); reactivity of the cell (R. S. LILLIE); physical structure of protoplasm (R. CHAMBERS) mitochondria, Golgi apparatus, and chromidial substances (E. V. COWDRY); behavior of cells in tissue cultures (W. H. LEWIS and MARGARET R. LEWIS); fertilization (F. R. LILLIE and E. E. JUST); cellular differentiation (E. G. CONKLIN); the chromosome theory (C. E. McCLUNG); and Mendelian heredity in relation to cytology (T. H. MORGAN). Mention is made of studies of the permeability of cell membranes in plants, of results of micro-dissection of certain plant cells, of cell division in plants "by the deposition of separate granules which subsequently coalesce to form a wall," of mitochondria and similar structures in plant cells, and of Mendel's work with peas.—C. E. Allen.

1181. HEGNER, R. W. *The mass relations of cytoplasm and chromatin and their bearing on nuclear division and growth.* Scientia 35: 407-414. 1924.—In this paper the writer attempts to interpret the results of observations and experiments on the rhizopod protozoa, *Arcella dentata* and *A. polypora*, and the intestinal ciliate of the frog tadpole, *Opalina*. At each particular stage in the life cycle of these organisms there is under normal conditions a rather definite amount of cytoplasm associated with each nucleus. The size of the nucleus is an indication of the quantity of chromatin contained within it; and the amount of chromatin is the real factor involved in the ratio of nucleus to cytoplasm. Nuclear division is initiated by an increase in the amount of cytoplasm as compared with that of the nucleus. These generalizations may be limited in their application but appear to be of very great significance in both biology and medicine and may be found useful in the interpretation of data obtained by cytologists, embryologists, protozoologists and other investigators who are engaged in the elucidation of the many complex problems involved in the subject of cellular biology.—Author.

1182. HOCQUETTE, MAURICE. *Observations sur le nombre des chromosomes chez quelques Renonculacées.* [Observations on the number of chromosomes in some ranunculaceae.] Compt. Rend. Soc. Biol. 87: 1301-1303. 1922.—For each of 16 ranunculaceous species the author discusses and lists the chromosome number, counted at metaphase in clear mitotic figures and after examination of preceding and following sections.—Frederick V. Rand.

1183. IKARI, JIRO. *On the formation of auxospores and resting spores of Chaetoceras teres* Cleve. Bot. Mag. Tôkyô 35: 222-227. 1 pl. 1921.—In the auxospore formation of *Chaetoceras teres*, which belongs to the 4th type of Karsten's so-called "asexual auxospore formation," a small pore appears in the middle portion of the narrow girdle. Soon after, a 2d small pore appears in the middle portion of the side directly opposite the 1st pore. The

formation of the 2nd pore does not take place in other members of the genus studied by the author (*C. debile*, *C. scolopendra*, etc.) A small portion of the cell contents bulges out through the 1st pore, the nucleus glides out into the extruded portion and the chromatophores move outward and come to occupy a parietal position. The whole extruded portion then separates off and becomes an auxospore. The outer membrane (perizonium) is thick, while the inner membrane is much thinner and from it the epitheca and the hypotheca are successively formed. Setae originate from the epitheca. Cell division of the auxospore ensues soon after its formation, producing the daughter chain which consists of 8-9, rarely 12, cells. The resting spores are often formed in the middle portion of the mother cell. Both crowns of the puncta and fine hairs are found in the valves of one and the same spore, when the latter is fully developed.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1184. ISHIKAWA, MITSU HARU. *Cytological studies on Porphyra tenera* Kjellm. Bot. Mag. Tôkyô 35: 206-218. 1 pl., 14 fig. 1921.—The delicate wall of *Porphyra tenera* gives the reactions for pectic substances. The chromatophore is arachnoid and has a pyrenoid embedded in the central portion. The nucleus is always excentric and of a primitive type, that is, it contains a globular mass of chromatic substance. At the time of division it splits into 3 chromatic filaments, each of which is transversely divided into 2 segments. The 3 daughter segments thus formed draw together and form a new nucleus.—The sperm mother cell or antherid divides into octants by 3 planes that are perpendicular to one another. Each octant is divided again into 8 or 16 cells which become spermatia. The spermatium is spherical; it contains a colorless chromatophore and 3 chromatic granules which are regarded as the nucleus in an active condition.—The carpogone produces a trichogyne at each or either end. Several spermatia are often found attached to 1 trichogyne. The migration of the nucleus of the spermatium, conjugation of the nuclei, and subsequent nuclear division could not be followed, although the divided nucleus of the zygote was observed. The divided nuclei are not the same size. The larger nuclei in the carpogone persist and give rise to the nuclei of the carpospores. The smaller nuclei degenerate at once, or form daughter nuclei that degenerate. The 1st division of the zygote is thought to be a reduction division. The thallus of *Porphyra* is the gametophyte, the fertilized carpogone the sporophyte. The carpogone produces 8 carpospores by 3 successive divisions similar to those forming the spermatium. Each carpospore contains an arachnoid chromatophore and a resting nucleus.—*Porphyra*, *Bangia*, *Porphyridium* and *Prasiola* may be united into 1 group (the Bangiales) because of the arachnoid chromatophore and the incipient nature of the nucleus. The non-motile gametes and the incipient nature of the nucleus show that the Bangiales are related to the Cyanophyceae. The relationship between the Cyanophyceae and Rhodophyceae is also shown by the fact that certain species of both groups contain both phycoerythrin and phycoerythrin. The relationship between the 2 groups is distant, the Bangiales being the nearest approach to a connecting link.—*Author.* (*Courtesy Japanese Journ. Bot.*)

1185. ISHIKAWA, MITSU HARU. *On the chromosomes of Lactuca.* (Japanese.) Bot. Mag. Tôkyô 35: (153)-(158). *Illus.* 1921.—Meiotic chromosome numbers were found in the pollen mother cells of the following species and varieties of *Lactuca*, many of which grow wild in Japan. *L. Keiskeana*, *L. lanceolata*, *L. lanceolata* var. *platyphylla*, *L. denticulata*, *L. denticulata* var. *pinnatifidula*, and *L. chelidoniifolia* have 5 chromosomes; *L. dentata* var. *alpicola* 7; *L. stolonifera*, *L. répens*, *L. Matsumurae*, and *L. tamagawensis* 8; *L. laciniata*, *L. Raddeana*, *L. triangulata*, *L. scariola* var. *sativa* and *L. villosa* 9; *L. dentata* vars. *albiflora* and *alpicola* have 12, while 24 chromosomes are found in *L. debilis*.—The author classifies these species according to form, size, and number of chromosomes and finds that they fall into 5 groups. These groups differ from one another in general taxonomic characters. Nakari has suggested that the Japanese species of *Lactuca* be divided among 4 genera (*Lactuca*, *Crepidiastrum*, *Paraixeris* and *Ixeris*). His genus *Lactuca* corresponds to the 1st group of the author; *Crepidiastrum* to the 2nd; *Paraixeris* to the 3rd, and *Ixeris* to the 4th and 5th. It is noteworthy that these results obtained independently by taxonomic and cytological studies are in general accord with each other.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1186. KOMURO, HIDEO. *On the modification of the cells of Vicia faba irradiated by Röntgen rays and their resemblance to those in malignant tumors.* (Japanese.) Bot. Mag. Tôkyô



36: (97)-(101). 1922.—This is a Japanese translation of the following entry.—*Author (Courtesy Japanese Jour. Bot.)*

1187. KOMURO, HIDEO. Preliminary note on the cells of *Vicia faba* modified by Röntgen rays and their resemblance to tumor cells. Bot. Mag. Tôkyô 36: 41-45. 1922.—The seed of Hyogo, a race of *Vicia faba*, were steeped in H<sub>2</sub>O for 77 hours until the H<sub>2</sub>O content reached about 58%, exposed to the rays of 2OH, 4OH and 5OH, respectively, and then sown in sand. After 8 days all the seedlings irradiated reached nearly the same stage of growth. The tips of radicles thus differently radiated, together with the controls, were fixed in Flemming's mixture and studied cytologically. Cytological differences noted in the irradiated plants include: (1) Mitoses rare, when present, anomalous and with the chromosomes varying greatly in size and irregularly distributed on a multipolar spindle; (2) giant cells and nuclei, the nuclei showing a noticeable decrease of chromatic material; (3) nuclei and nucleoles generally larger than in controls, nucleoles more numerous and with an abundant vacuolization; (4) cells of the pleorome binucleate and the nuclei variable in size; in the control, rarely binucleate and nuclei uniform in size; (5) cells with more than 2 nuclei showing a corresponding decrease in amount of cytoplasm; (6) pycnotic cells, even in the embryonic region; karyolitic cells of common occurrence in the periblem.—The degenerative cells above noted are very interesting inasmuch as they resemble those in tumor cells studied by T. Kimura, and this resemblance does not seem to be accidental. It would be too bold to compare the changes of cell elements in the author's case directly with those of carcinoma, yet it may be safely said that irradiation of X-rays (large doses) upon the seed of *Vicia faba* leads the cells of radicles to a diseased or senescent condition resembling that of tumor cells. [See also preceding entry.]—*Author. (Courtesy Japanese Jour. Bot.)*

1188. KUWADA, YOSHINARI. On the so-called longitudinal split of chromosomes in the telophase. Bot. Mag. Tôkyô 35: 99-105. 1 pl. 1921.—A light space often seen in the telophasic chromosomes along their median line is taken by some authors for the beginning of their longitudinal split in the next division; others think that the true split appears first in the early prophase of the latter division. To decide between these 2 contrary views the author has studied the nuclear division in the root tips of *Vicia faba*. In telophase the chromosomes take the form of a reticulate band consisting mostly of a row of meshes; a light line which is then seen along the median line of every chromosome is not a true split, but belongs clearly to a part of such meshes. Before the nucleus enters the resting stage the substance of the chromosomes becomes drawn out so as to form anastomoses. When the preparation for the next division begins such anastomoses gradually disappear; individual chromosomes become distinct and then the new chromosomes begin to appear inside the old ones as single, not double, threads. The author has further ascertained the fact that somewhat later the true longitudinal split begins to appear for the 1st time in these new chromosomes. From all of his observations the author agrees with the 2nd of the above-mentioned views: that the light line seen in the telophasic chromosomes is not a true split, and that the true split appears first in the early prophase.—*S. Ikeno. (Courtesy Japanese Jour. Bot.)*

1189. LEVINE, MICHAEL. A comparative cytological study of the neoplasms of animals and plants. Proc. Soc. Exp. Biol. and Med. 21: 506-508. 1924.—The abnormality in neoplastic diseases of plants is found in the rate of division rather than in the character of the division. In animal cancer both the rate and character of the divisions are aberrant.—*M. M. Brooks.*

1190. MOREAU, FERNAND. Une anomalie dans l'histoire nucléaire des spores de l'*Endophyllum Sempervivi* Lév. Bull. Trimest. Soc. Mycol. France 35: 98-102. Fig. 1-14. 1919.—The author, in translation, concludes as follows: We witness, then, in the spore of *Endophyllum Sempervivi* . . . the division of 2 nuclei into 4, of which 2 degenerate immediately, the 2 nuclei left fusing in the mature spore.—*Frederick V. Rand.*

1191. PAILLOT. Les Bactéries parasites des insectes. [Bacteria pathogenic to insects.] Ann. Serv. Epiphyties. 8: 95-275. Pl. 1-8, fig. 1-89. 1922.—Bacteria obtained from diseased insects were mostly cocci; but the same coccus, which typically shows as a short motile rod when infecting its normal host, may have a different morphological appearance when grown on nutrient agar or when inoculated into the serum of insects belonging to different species from that which it infects in nature. Cytological studies brought forth evidence of a differentiated

nuclear substance, usually occurring as parallel bands within the cell. This chromatophilous substance was even observed to condense into a true nucleus from the cytoplasm of certain "formes de croissance," which are gigantic, cell-like, forms obtained from the bacteria when grown in a sugar-containing medium or in the serum of some uncongenial host. *Bacillus hoplosternus*, from diseased *Melolontha vulgaris*, is the only spore-forming bacillus known to be pathogenic to insects. Some bacteria previously described from diseased insects were rediscovered by Paillet, among these may be mentioned *Bacillus lymantriae* from *Lymantria dispar* and a form resembling *Bacillus fluorescens liquefaciens* Flügge. Most of the species investigated, however, are new to science.—*J. Dufrenoy.*

1192. PETERSCHILKA, F. Beitrag zur Kernteilung und Parthenosporenbildung von *Spirogyra mirabilis* Kütz. (Zur Cytologie der Chlorophyten. II.) [Nuclear division and azygospore formation in *Spirogyra mirabilis*.] Arch. Protistenk. 46: 153-165. Pl. 9-10, 8 fig. 1923.—The structure of the vegetative cell is described in detail. The nucleus contains a "Binnenkörper" which contains all or most of the chromatin. In some cases chromatic granules connected by fibrils to the Binnenkörper, were observed in the outer nucleus. In nuclear division the Binnenkörper elongates and then becomes constricted into 2 parts which remain connected for a time by a thin "tube" of protoplasm, representing the stretched membrane of the original Binnenkörper. The threads originally present in the nucleus now tend to disappear. Later, long and short threads again appear in the nuclear sap as connections between small granules; from these threads the nuclear network is derived. The entire nucleus next constricts in the middle, forming 2 daughter nuclei.—The formation of azygospores is also described in detail. The author concludes that *Spirogyra mirabilis* shows amitotic division without differentiation of chromosomes; that the nucleus is a metakaryosome-nucleus, and the nucleus a metakaryosome; that, in the formation of the azygospore, the outer nucleus degenerates and all the chromatin lies in the metakaryosome; and that the azygospore contains only 1 nucleus, the original cell nucleus.—*R. P. Hall.*

1193. SEDGEWICK, PAUL J. Life history of *Encephalartos*. Bot. Gaz. 77: 300-310. Pl. 21-22, fig. 1-4. 1924.—An extensive free nuclear period follows the germination of the megaspore. The pollen chamber begins to form within the nucellus while the gametophyte is still in an early free nuclear stage. It appears first in the central portion of the nucellus below the nucellar beak. The male gametophyte has prothallial, stalk, body, and tube cells. The body cell was observed with 2 prominent blepharoplasts. The pollen tube is unbranched. The central cell nucleus enlarges greatly before its division to form the ventral canal and egg nuclei. Increase in the volume of the nucleus takes place by the bodily inclusion of masses of cytoplasm. The ventral canal nucleus frequently does not promptly degenerate, but enlarges, goes through a period of maturation very similar to that of the egg, and passes toward the egg, suggesting a probability of fusion of egg and ventral canal nuclei. No proembryos were found containing sperm remnants, indicating that fertilization by a sperm is not necessary for the production of the proembryo. The 1024-nucleate stage of the proembryo shows neither walls nor evanescent segmentation. Evanescent segmentation may have occurred following this 10th division, but its disappearance or its failure to appear, whichever is true, indicates that another division is to take place. The proembryo becomes completely cellular. Later a vacuole forms by the breaking down of the central portion of the proembryonal tissue; eventually this tissue is completely resorbed.—*Author.*

1194. SINOTO, YOSITO. On the extrusion of the nuclear substance in *Iris japonica* Thunb. (Japanese.) Bot. Mag. Tôkyô 35: 178-195. 1921.—The so-called cytomyxis was often observed in preparations of *Iris japonica*. The following is a summary of the results of the author's observations on this phenomenon: The phenomena of extrusion of the nuclear substance from one cell into cytoplasm of adjacent cells are observed in pollen mother-cells as well as in tapetal, ovular and nucellar cells. The extrusion in the pollen mother-cells is most active in the synaptic stage and occurs not infrequently in the presynaptic, spireme and hollow-spireme stages and sometimes even immediately before the diakinesis stage. In somatic cells this process is generally observed in the nuclei which are not in division. The parts of the nucleus which partake in the extrusion may be chromatin, synaptic mass, spireme, nucleolus, etc. On the basis of these observations, the author is inclined to the opinion that this



phenomenon is chiefly due to the deleterious action of fixing fluids as well as to external injuries caused by pressure at the time of fixation.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1195. SINOTO, YOSITO. On the extrusion of the nuclear substance in *Iris japonica* Thunb. Bot. Mag. Tôkyô 36: 99–110. 18 fig. 1922.—This is an account in English of observations that had been previously published in Japanese. [See also preceding entry.]—*S. Ikeno.* (*Courtesy Japanese Jour. Bot.*)

1196. TAHARA, MASATO. Cytologische Studien an einigen Kompositen. [Cytological studies on certain Compositeae.] Jour. Coll. Sci. Imp. Univ. Tôkyô 43: Art. 7, 53 p. 4 pl., 15 fig. 1921.—This is a study of certain *Chrysanthemum* and *Erigeron* species. Many *Chrysanthemum* species (namely, *C. roseum*, *C. cinerariifolium*, *C. segetum*, *C. carinatum*, *C. coronarium*, *C. nipponicum*, *C. japonicum*, *C. lavandulaefolium*, and *C. lineale*) have 18 chromosomes (9 haploid) at the time of mitosis. The haploid number of certain *Chrysanthemum* species is, however, a multiple of 9. Thus, *C. indicum* and *C. Leucanthemum* have 18, *C. hakusanense* and *C. morifolium* 21 [27?], *C. Decaisneum* 36, while *C. marginatum* and *C. arcticum* have 45.—The prophase of the heterotypic division of *C. coronarium* was studied in detail. The parallel arrangement of homologous threads and the splitting of each was observed. In the cross wall formation at the tetrad stage 4 tetrahedrally arranged invaginations appear at the cell wall and these grow to the center of the cell where they unite with one another.—In *Erigeron annuus*, which is parthenogenetic, the pollen grains are dissimilar in size. The 1st mitosis in the embryosac mother cell is not a heterotypic division. After the 2nd division there is no cross wall formation, the 4 nuclei present each dividing again. These 8 nuclei, with a diploid chromosome number (28), become organized into an embryosac. In the mature embryosac the polar nuclei are separated from each other by a mass of cytoplasm. The chromosome number of the endosperm nuclei is hexaploid.—*Erigeron linifolius* has the normal type of macrogametophyte development; the haploid number of this species is 26 or twice that of *E. annuus*. Antipodal development is anomalous in *E. linifolius* since but 2 antipodals are formed. These later give rise to a linear series of uni-, bi- or multinucleate cells.—*Erigeron dubius*, with a small chromosome number (9 haploid), also develops a normal macrogametophyte. In this embryosac there is no formation of walls after the homeotypic division and divisions of the nuclei may continue until there are 16 nuclei at the time cell formation takes place in the macrogametophyte.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1197. TAKAMINE, NOBORU. Some observations in the life history of *Isoetes*. Bot. Mag. Tôkyô 35: 184–190. 9 fig. 1921.—Each female gametophyte has 5–6, rarely more than 10 archegonia. When one of them is fertilized, all others degenerate, though rarely 2 or more may be fertilized and develop to a certain extent. The archegonium consists normally of 16 neck cells, 1 neck canal cell, and the egg. Near the nucleus of the egg 2 or more rounded bodies appear, which stain deeply with iron-alum-haematoxylin. These are considered to be chromatophores. The diploid number of chromosomes is 22 in *I. asiatica* and 43–45 in *I. japonica*. The hybrid *I. japonica* × *I. asiatica*, and its reciprocal were raised.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1198. VAN CAMP, GASTON M. Le rôle du nucléole dans la caryocinèse somatique (*Clivia miniata* Reg.) [Role of the nucleolus in somatic mitosis (*C. miniata* Reg.)] La Cellule 34: 5–49. 2 col. pl. 1924.—In the nuclei of the root meristem of *Clivia miniata* the reticulum is basophile and the nucleolus acidophile and iron-avid. The developing prophasic spiremes are in contact with the nucleolus, and become increasingly iron-avid as the latter decreases in volume, fragments, and becomes less iron-avid. By the end of the prophase, the nucleolar material has usually passed entirely to the chromosomes, which however remain basophile at all stages. In case untransferred nucleolar material remains, it is resorbed in the cytoplasm. The chromosomes are not simply impregnated by the nucleolar substance: the 2 materials form a new complex, "kinochromatin." In the telophase the 2 substances undergo a dissociation: the iron-avid and acidophile material appears at certain points along the chromosomes in the form of small globules which fuse to form the nucleoli of the daughter nuclei.—The nucleolar substance is neither a waste product nor a spindle-forming material. It is not a reserve of chromatin, but rather a substance which contributes to the formation of chromatin. Chromomeres represent stages in the addition of the nucleolar material to, or its retraction from, the

chromosomes. Prochromosomes are regions at which the kinochromatin is not dissociated at telophase. In young tissue the volume of nucleolar material is proportional to that of the nucleus; the proportion decreases as prochromosomes appear, this being 1 of the 1st indications of a decrease in the dividing power of the nucleus.—*L. W. Sharp.*

1199. WYLIE, ROBERT B. *Sperms of Vallisneria spiralis*. Bot. Gaz. 75: 191-202. Pl. 8-10. 1923.—To overcome the interference offered by the gelatinous covering of the ovules, the author chilled the ovules during fixation to retard development until after the fixing agent had penetrated. The author's summary of the behavior of the sperms follows: The male cells are organized in the pollen grain following division of the generative cell, and are united by their tips until the embryo sac is reached. The sperms become greatly elongated during their journey through the pollen tube. The tube nucleus may either precede or follow the sperms in the pollen tube. The tube nucleus becomes greatly elongated after leaving the pollen grain, and in its later disintegration probably contributes the x-bodies so conspicuous in the tips of pollen tubes in the embryo sac. Pollen tubes within the ovarian chamber often form tuber-like enlargements at their tips, containing male cells and also x-bodies obviously derived from the tube nucleus. The sperms are released as distinct male cells, from the tip of the pollen tube after it enters a synergid. The sperm which unites with the egg possesses a cytoplasm about its nucleus when this gamete comes in contact with the egg cell. The 2nd sperm loses its cytoplasm shortly after it enters the embryo sac, and its naked spherical nucleus is carried to the polars in a strand of cytoplasm. A 2nd pollen tube frequently enters the ovule, and this discharges into the remaining synergid. Its male cells seem to remain near the tip of the tube and there is no evidence of polyspermy. The possession of male cells as gametes is not necessarily associated with chalazogamy as reported by Nawaschin, but may be limited to the more primitive orders as he suggests. The union of the male and female gametes as cells probably means that some or possibly all of the cytoplasm of the male cell enters the egg at the time of fertilization.—*B. W. Wells.*

## ECOLOGY AND PLANT GEOGRAPHY

GEO. D. FULLER, *Editor*

(See also in this issue Entries 1039, 1070, 1073, 1079, 1101, 1124, 1136, 1154, 1304, 1508, 1537, 1555, 1581, 1585, 1587, 1615, 1622, 1627, 1662, 1811, 1828, 1944, 1979, 1980, 2048, 2079, 2085, 2090, 2094, 2097, 2098, 2099)

### GENERAL, FACTORS, MEASUREMENTS

1200. ANONYMOUS. *Phytogeographic map of Louisiana*. Louisiana Dept. Agric., Baton Rouge, Louisiana, 1921.—A map 24 × 17 inches shows in colors the plant areas of the state; marsh lands, alluvial lands, wooded alluvial or cypress lands, longleaf pine hills and flats, shortleaf pine hills, prairie lands, bluff lands and uplands.—*A. M. Taylor.*

1201. ANTEVS, ERNST. *The big tree as a climatic measure*. Carnegie Inst. Washington Year Book 22: 299-301. 1924.—A review of Huntington's data on tree-growth is presented. The influence of each climatic condition upon tree growth is dependent on the time of its action, on the other effective external conditions, and on internal conditions in the tree. Precipitation, temperature and solar radiation appear to be the chief external influential conditions.—*B. E. Livingston.*

1202. BLACK, J. M. *The primitive flora of Adelaide*. South Australian Nat. 1: 42-44. 1920.—This consists of a discussion of the changes which have followed settlement.—*Wm. Randolph Taylor.*

1203. BURKHOLDER, WALTER H. *The effect of varying soil moistures on healthy bean plants and on those infected by a root parasite*. Ecology 5: 179-187. 1924.—The plants were grown in greenhouses in sealed glazed earthenware jars, about 19 × 19 cm. in size. The soil was a sterilized mixture of rich garden loam and sand, with a water holding capacity of 72%. Three soil moistures were used, 33, 50, and 66 %. The root parasite was *Fusarium martii phaseoli* Burkholder. The bean plant (Wells Red Kidney) is very sensitive to changes in the



moisture content of the soil and infection increases the sensitiveness. Healthy plants grown in dry soil up to blooming time, respond very quickly to additional moisture, while infected plants will not react. The diseased plants, in order to produce a comparatively good yield, need plenty of moisture through podding time. Healthy plants grown in medium-wet soil yield better if the moisture content remains unchanged at blooming time than if changed. The optimum soil moisture for healthy plants was about  $\frac{1}{2}$  of the water holding capacity.—*J. E. Weaver.*

1204. CANNON, WILLIAM AUSTIN. General and physiological features of the vegetation of the more arid portions of southern Africa, with notes on the climatic environment. Carnegie Inst. Washington Publ. 354. viii + 159 p., 31 pl., 13 fig. 1924.—This is the 3rd publication by the author on comparative vegetational characteristics of arid regions. Earlier ones are on southern Algeria and on South Australia (Publications 178 and 308, Carnegie Inst. Washington). In the present work a sketch is given of the most striking features of the perennial vegetation of arid and semi-arid regions of southern Africa, together with an account of the climatic characteristics, comprising temperature, rainfall and evaporation. Most of the work was done in the Central Karroo, but other regions were visited and are discussed. The Livingston porous-porcelain atmometer was used for evaporation studies undertaken at several stations with the assistance of local scientists; results of these studies are given. The Stahl-Livingston method of studying foliar transpiring power was used on perennials of different growth habits, including succulents and sclerophylls, mainly in the Central Karroo, but some observations are reported for *Welwitschia mirabilis* and other species of the same habitat in southwestern Africa. The morphological portion of the study comprises an account of the root habits of several perennials of the Central Karroo, together with a comparative account of leaf structure with especial reference to origins. The structures are studied with reference to the physiological processes, especially transpiration. Regional maps and photographs of plants and plant habitats are given.—*Author.*

1205. CLEMENTS, F. E. Methods and principles of palaeo-ecology. Carnegie Inst. Washington Year Book 22: 319. 1924.—Modern species appeared much earlier in the Tertiary than has been supposed and the North American climatic climaxes of the Tertiary closely resembled present ones in character if not in extent. Migration in the past seems to have been mainly the result of climatic change, the climax areas expanding or contracting but never disappearing.—*B. E. Livingston.*

1206. CLEMENTS, F. E., AND E. S. CLEMENTS. Changes in grassland. Carnegie Inst. Washington Year Book 22: 316-317. 1924.—A brief discussion is given of probable changes that may have taken place in the grassland of the western U. S. A., in consequence of climatic change, fire and grazing.—*B. E. Livingston.*

1207. CLEMENTS, F. E., W. V. MULLIN, R. J. GILMORE, AND J. H. C. SMITH. Research in hay-fever: Rocky Mountain and Mississippi Valley regions. Carnegie Inst. Washington Year Book 22: 322. 1924.—The following points are brought out, with other information: (1) Rain clears the air of pollen. (2) The amount of pollen in the air varies with wind velocity. (3) The amount of air-borne pollen attains a maximum 1-3 hours after the anthers have discharged. This maximum usually occurs in the forenoon.—*B. E. Livingston.*

1208. DZIUBALTOWSKI, SEWERYN. La distribution et l'écologie des associations step-piques sur le plateau de la Petite Pologne. [The distribution and ecology of steppe associations on the Plateau of Little Poland.] Acta Soc. Bot. Poloniae 1: 185-200. 1923 [1924].

1209. EASTON, E. J., AND K. F. MEYER. Occurrence of bacillus botulinus in human and animal excreta. XXI. Jour. Infect. Diseases 35: 207-212. 1924.—Evidence is presented to strengthen the idea that animal manure or human excreta is of little or no importance in the distribution of *B. botulinus*. Where the organism appears in the excrement it is resident in the fecal remnants of the spoiled food.—*R. L. Starkey.*

1210. FRANDT, B. Das Vehnemoor in Oldenburg, eine sterbende Naturlandschaft. [The Vehn Moor in Oldenburg, a dying landscape.] Naturwissenschaften 11: 677-679. Fig. 1. 1923.

1211. GREENMAN, J. M. Opportunities for botanical research in Central America. Illinois Acad. Sci. Trans. 16: 76-81. 1923.—Central America offers unusual opportunities for

research for the systematist, the ecologist, the plant geographer and economic botanist. There exists no complete or comprehensive published flora of these countries. The varied geographic and climatologic conditions in a small area offer exceptional opportunities for the ecologist to study his problems. This is illustrated by the conditions as one crosses the Republic of Costa Rica, where altitude, humidity and temperature vary extremely within short distance. The plant geographer would be interested in studying the possible northward migration of the tropical plants since the glacial period. Many plant products obtained from the topics of the old world should be secured from Central America and for this purpose the economic botanist should turn his attention to this country.—*H. W. Anderson.*

1212. I[SING], E. H., AND W. H[AM]. *Ecology of Kangaroo Island.* South Australian Nat. 4: 105-106. 1923.—The shore and bush plants are discussed.—*Wm. Randolph Taylor.*

1213. KORSTIAN, C. F. *Natural regeneration of southern white cedar.* Ecology 5: 188-191. Fig. 1. 1924.—This is an ecological study of *Chamaecyparis thyoides*, mentioning previous work done, and giving habitat, the great variety of associates, the effect of fires, seed, seedlings, reproduction, logging, and natural regeneration. Where fires are properly controlled natural revegetation of the southern white cedar is assured but severe burns produce a complete change in the natural succession.—*T. J. Fitzpatrick.*

1214. MOORE, DWIGHT MUNSON. *A botanical survey of the campus of Denison University.* Denison Univ. Bull. 23: 131-153. Pl. 17-19, fig. 1-7. 1923.—This study is limited to the phanerogams, which are listed, and to a discussion of some ecological aspects of the local flora.—*Frederick V. Rand.*

1215. PLITT, CHARLES C., AND LOUIS J. PESSIN. *A study on the effect of evaporation and light on the distribution of lichens.* Bull. Torrey Club 51: 203-210. 1924.—A study was made of the effect of certain climatic conditions on the distribution of the lichens on a tree on Mt. Desert Island, Maine. The data presented can be summarised as follows: "The evaporating power of the air was found to be different at the different sides and heights of the tree" and seemed "to be the condition which most affects the distribution of lichens." Some lichens are restricted to certain heights or sides of the trunks, others seem to have no such restrictive distribution.—*P. A. Munz.*

1216. ST. JOHN, HAROLD, AND WILBUR DOANE COURTNEY. *The flora of Epsom Lake.* Amer. Jour. Botany 11: 100-107. 1 fig. 1924.—Epsom Lake, in Okanogan County, Washington, is in a basin of nearly pure  $MgSO_4 \cdot 7H_2O$ . On the slopes above the lake were found 58 species of vascular plants; in the slimy water of the lake, 1 species; and rooting on the pure white salt, 14 species (all listed). These plants are all halophytes, identical with or similar to those of salt marshes. Magnesium sulphate is ordinarily very toxic, and since this salt is the only substance common to this lake and to salt marshes, it is probably the factor that limits plant growth in both regions, either by killing all plants not tolerant to it, or by its high concentration causing an increased osmotic pressure and thus reducing the amount of available water.—*E. W. Sinnott.*

1217. SHREVE, FORREST. *Ecology of the Santa Lucia Mountains.* Carnegie Inst. Washington Year Book 22: 62-63. 1924.—Comparisons are presented of a xerophyllous chaparral and a redwood forest in the Santa Lucia Mountains near Carmel, California. The summer value of the ratio of soil-moisture content (15 cm. deep) to evaporation rate was found to be 0.4 for the forest and 5.2 for the chaparral. For Tucson, in the habitat of the giant cactus, the corresponding value is 50.5 making the maintenance of a balance between water income and water outgo 126 times as difficult in the habitat of the giant cactus as in that of the redwood.—*B. E. Livingston.*

1218. SHREVE, FORREST. *Soil temperature as influenced by altitude and slope exposure.* Ecology 5: 128-136. Fig. 1-6. 1924.—This paper is based on the records of 6 Friez soil thermographs operated at depths of 3 inches for about 24 weeks during 1921 and 1922. The records were secured from opposed slopes ranging from 3000 to 9000 feet in the Santa Catalina mountains, near Tucson, Arizona. The mean temperature from the end of the 1st week in May to the end of the 1st week in September, 1922, on the south-facing slope was 76.6°F. at 7000 feet, 71.8°F. at 8000 feet, and 69.6°F. at 9000 feet. On north-facing slopes the temperature was lower than at the same elevation on south slopes. The maximum temperatures showed



greater differences than the minima with differences of altitude or slope exposure. The difference between maxima on south and north slopes increased with increasing altitude, while the minima were sometimes as low at the lower altitudes as at the higher. The average maximum temperatures during the summer of 1922 at 7000 feet were 91.9°F. on the south slope and 78.9°F. on the north slope; at 8000 feet, 82.6° and 62.4°F; and at 9000 feet, 77.7° and 59.3°F. The average minima at the 7000-foot level were 61.3°F. on the south slope and 50.6°F. on the north slope; at 8000 feet, 60.9° and 56.5°F.; and at 9000 feet, 61.6° and 53.1°F. The generalizations are made that "the temperature of the soil is of less importance than the ratio of evaporation to soil moisture in determining the 'alternation' of vegetation on opposed slopes at different altitudes," and that "it appears probable that the relative importance of soil temperature, in connection with slope differences of vegetation, increases greatly at high altitudes and latitudes."—*Herbert C. Hanson.*

1219. SUNIER, A. L. J. *The laboratory for marine investigations at Batavia.* (A new tropical marine biological station.) *Treubia* 3: 127-148. *Pl.* 1-9. 1923.—The author is the chief of the above named station, the erection of which was initiated in 1919. While chiefly devoted to zoology, a garden for East Indian beach and coast plants has been set aside. The pond and swamp present a natural environment for brackish water plants, those already growing being listed. Buitenzorg is near enough to Batavia to make this station of especial interest.—*M. B. Church.*

1220. SZYMKIEWICZ, DEZYDERY. *Etudes climatologiques.* [Climatological studies.] *Acta Soc. Bot. Poloniae* 14: (1-19). 1923; and 2<sup>2</sup>: (1-22) 3 *fig.* 1924.—In the valley of Ojcow the climates of 4 different stations were studied comparatively. Transpiration on the mountains of the temperate zone is weaker than on the plains, hence an alpine climate is considered more humid than that at its base. A station with some alpine plants was found to be more humid than one where they were absent. In the valley a stratum of air about 2 m. above the soil differs little in humidity for neighboring stations, but a stratum nearer the soil varies, due to the formation of heavy dews and fogs.—Part IV of the study is devoted to the ecological role of winds. A series of treeless stations are compared, beginning with the coldest regions of the globe. The author concludes that strong glacial winds entirely prevent tree growth, while some very windy, warmer regions may show a peculiarly deformed tree growth.—*M. B. Morgan.*

1221. VRIES, HUGO DE. *Die statistische Methode in der Pflanzengeographie.* [The statistical method in plant geography.] *Naturwissenschaften* 11: 189-194. 1923.—De Vries holds as a result of the application of statistical methods to the problem that the origin of species and their migration afterwards is, in its essence, a mechanical process in which biological changes play only a minor role. The struggle for existence may determine life or death, but for genera and species it would come into play only when they were very young. After the unsuited forms had died out the remaining forms would all have about the same chances for existence and spread as the forms from which they were derived. The hypothesis of numerous extinct intermediate forms, which, according to some is needed to make clear the upbuilding and separation of the present living genera and species is superfluous. The struggle for existence plays a large role in the survival of individuals but for the development of the extreme richness in forms in nature it has practically no importance.—*Orton L. Clark.*

1222. WEAVER, J. E., AND JOHN W. CRIST. *Direct measurement of water loss from vegetation without disturbing the normal structure of the soil.* *Ecology* 5: 153-170. *Pl.* 3. 1924.—"A method has been devised for determining the water losses from square-foot areas of native grassland and cultivated crops without disturbing the soil structure. It consists in excavating soil columns 3 feet deep and forcing galvanized iron cylinders over these tightly as they are formed. The columns are then smoothly cut off and bottoms sealed to the cylinders, which, after weighing, are replaced in trenches so that after refilling the interspaces between the cylinders in the trench the vegetation in the containers is completely surrounded by undisturbed grassland or a crop similar to that enclosed in the soil column. The containers are covered during rain and water added to the soil as needed for a 15-day period after which they are reweighed and the losses calculated. Direct losses from the soil and from soil covered with dead plants are determined by control soil columns." The method was used in the short-

grass plains at Burlington, Colorado, in mixed prairie at Phillipsburg, Kansas, and in true prairie at Lincoln, Nebraska. Experiments were conducted in which the native vegetation of each site was used, as well as alfalfa, oats, and millet. The average daily losses from native vegetation were 0.96 pound in Colorado, 1.33 in Kansas, and 0.85 at Lincoln. The period in which the Colorado experiment was conducted was unusually moist. Calculations show that sufficient water is lost from vegetation to furnish the mean annual precipitation in each of these places.—*Herbert C. Hanson.*

### STRUCTURE, BEHAVIOR, SYMBIOSIS

1223. BLOCH, E. Dissymetries de structure de rhizomes soumis à certaines actions mécaniques.—Leur étude expérimentale. [Asymmetric development of rhizomes in response to certain mechanical stimuli.] *Ann. Sci. Nat. Bot.* 10<sup>e</sup>. sér. 6: 169-244. *Fig. 1-36.* 1924.—Changes in size, shape, and general aspect, produced by growth in rocky, alpine soil, are discussed and figured.—*Paul Weatherwax.*

1224. CLEMENTS, FREDERIC E., AND FRANCES L. LONG. Experimental pollination: an outline of the ecology of flowers and insects. Carnegie Inst. Washington Publ. 336. vii + 274 p., 17 pl. (1 col.) 1923.—This treatment is a preliminary endeavor to organize the field of pollination upon an adequate experimental and quantitative basis in nature, with especial reference to the principles and methods of bio-ecology. Under normal and experimental pollination are considered some 17 species, treated with respect to the normal behavior of pollinators and the experimental response to change of position, mutilation, artificial and painted flowers, and the addition of honey and odor. There is an account of experiments on the competition among flowers of the same genus or family, as well as among those of widely separated groups. The composition and weight of pollen loads carried by bees receive attention. The final chapter is devoted to an examination of all the experimental results and conclusions in this field, considered under the following captions: (1) early experiments of Plateau and others, (2) main researches of Plateau, (3) related studies and critiques, (4) recent investigations, (5) senses of insects, (6) general résumé.—*F. E. Clements.*

1225. COSTANTIN, J. Remarques sur les relations des arbres avec les Champignons souterrains. [Relations of trees with subterranean fungi.] *Compt. Rend. Acad. Sci. Paris.* 178: 158-161. 1924.—A study is made of the interrelations of *Quercus* and the Tuberaceae. *Tuber brumale* was grown on sterile media and fruited in about a month, producing asci and ascospores. This demonstrates for the 1st time that the tree is unnecessary for even this stage of the life history of the fungus. Conidia are carefully described.—*C. H. Farr.*

1226. COUNCILMAN, W. T. The relation between the roots of plants and fungi. *Proc. Soc. Exp. Biol. and Med.* 21: 361-363. 1924.—A description of the symbiotic relation between roots of plants and fungi.—*M. M. Brooks.*

1227. DORPH-PETERSEN, K. How long do various seed species retain their germinating power. *Internat. Rev. Sci. and Pract. Agric. N. S.* 2: 283-301. 1924.—Among the Leguminosae tested, a few seed germinated after 25 years while very few grass species retained their germinating power more than 7-8 years. The seed of the Cruciferae retained their vitality for a comparatively long and those of the Umbelliferae for a comparatively short period. Detailed notes are given of the germinating power and germinating speed of seed of many species from the families mentioned, for periods up to 18 years.—*Geo. D. Fuller.*

1228. ELLIOTT, G. R. B. Relation between the downward penetration of corn roots and water level in peat soil. *Ecology* 5: 175-178. *Fig. 1-2.* 1924.—The height of the water level affected the vertical penetration but not the horizontal spread of the roots. The vertical penetration was bounded by a zone about 3 inches in thickness in which the roots flattened out. This zone was approximately 18 inches above the water table and parallel with it.—*J. E. Weaver.*

1229. GATES, FRANK C., AND ELSIE E. ERICKSON. Swamp and bog plants: *Iris versicolor* L. *Torreyia* 24: 55-57. 1924.—A study made at Douglas Lake, Michigan, showed that *Iris* plants growing in the bog environment differed from those in swamps in (1) a slight narrowing of the leaves, (2) a very conspicuous thickening of the cell-walls of the epidermis of the rhizome, and (3) in a reduction both in the amount of fruiting and in the size of the fruit.—*J. C. Nelson.*



1230. GENEVOIS, L. Contribution à l'étude de la symbiose entre Zoochlorelles et Turbellariés Rhabdocèles. [Symbiosis between Zoochlorella and rhabdocelidan Turbellaria.] Ann. Sci. Nat. Bot. 10<sup>e</sup> sér. 6: 53-72. Fig. 1-4. 1924.—The algal cells removed from *Dallyellia viridis* G. Shaw, *Typhloplana viridata* Abildgaard, and *Castrada viridis* Volz are found to be *Chlorella vulgaris* Beijerinck. Observations and experiments lead to the belief that the symbiotic relationship is not absolutely essential, since either the alga or the worm can live independently.—Paul Weatherwax.

1231. HEIDE, F. F. R. Biologische onderzoekingen bij Landbouwgewassen. II. Bloembestuiving in West-Java. [Biological studies of agricultural plants. II. Pollination in West-Java.] With English summary. Mededeel. Alg. Proefsta. Landb. Dept. v. Landb. Nijv. en Handel (Dutch East Indies) 14: 20-37. 1923.—The most important pollinating insects are bees, of the genera *Xylocopa*, *Apis*, and *Melipona*, particularly the 1st-named. *Vespa analis* visits flowers in hunting for small insects, and becomes an active agent in pollination. Butterflies are important pollinating agents at elevations between 2000 and 6500 feet.—Carl Hartley.

1232. Келлер, Б. [KELLER, B.] I. Экологические Формы в эволюции растительного мира, II. Исследование над ксероФитами, [I. Ecological forms in the evolution of the plant world. II. Investigations on xerophytes.] Дневник Русского Ботанического Конгресса. [Jour. Russian Bot. Congress] 1: 17-18. 1921.—Evolution is to a high degree ecological, external conditions having not only a selective but also a transforming significance in its process. It is indispensable to survey the ecology of plants by the comparative method within the limits of species groups systematically closely allied but ecologically distinct. In different plant groups there are general courses of evolutionary development influenced by environment, but each group has its own peculiarities in the course of its development. Studies of xeromorphic species of *Viola*, *Veronica*, *Asperula* and *Galium* illustrate this specific course of evolution.—V. Malchevski.

1233. Келлер, Б. [KELLER, B.] Исследование над галоФитами. [Investigations on halophytes.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 31-32. 1921.—*Salicornia herbacea*, a representative of the succulent halophytes, not only tolerates high salt content of the soil, but even reaches its optimum development at a certain degree of salt concentration. At first under the influence of salt, *Salicornia* grows vigorously and the osmotic pressure increases but little; when the salt concentration becomes too high, growth is retarded, the osmotic pressure rises suddenly and simultaneously the resistance of the plant to the desiccating influence of the medium increases extremely. *Frankenia pulverulenta*, a representative of non-succulent halophytes, under the influence of high salt concentration of the soil increases the excretion of drops of solution from its glands and shows its characteristic peculiarities in the diurnal loss of water. It uses the excreted soluble salts as an external osmotic apparatus and attains a high drought resistance. The significance of a monographic study of the ecological types is discussed.—A. Sennikov.

1234. LARBAUD, MARGUERITE. Modifications causées par le climat alpin dans le morphologie et l'anatomie florales. [Floral modifications caused by alpine climate.] Ann. Sci. Nat. Bot. 10<sup>e</sup> Sér. 5: 193-319. Pl. 1-10. 1923.—The characteristics of various species are described and tabulated for different altitudes from sea level to 3000 m. Species flowering in the spring in lowlands are retarded 2-4 months at higher altitudes and the retardation is greater on north slopes. Summer flowering plants are less retarded. The duration of anthesis is less at higher altitudes, but the size of the flower is little affected although the colors seem better developed at higher altitudes and there is a tendency to reduce the number of flowers. Calyx and bracts seem to become thicker and more persistent and also possibly more hairy. Modifications are generally more marked in the epidermis than in deep-seated tissues.—Paul Weatherwax.

1235. Максимов, Н., и Л. Кочановская [МАХИМОВ, N., AND L. КОЧАНОВСКАЯ.] Исследование над транспирацией растений в условиях субальпийской зоны, [Transpiration under subalpine conditions.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 31. 1921.—At the alpine station of the Tiflis Bot. Gard. (1800 m.) plants from the subalpine zone of the Trialette mountain chain were used. Attention was given

to the comparison of the intensity of transpiration by plants from open and shady habitats. The absolute magnitude of transpiration of high mountain plants did not differ from that of the mesophytes of Tiflis. Plants from open places sometimes transpired twice as much as shade plants. A correlation between the anatomical structure of the leaf and the intensity of transpiration was shown. Transpiration increased with the development of the palisade parenchyma.—*V. Malchevski*.

1236. MENZEL, R. Beiträge zur Kenntnis der Microfauna von Niederländisch-ost-indien. II. Über den tierischen Inhalt der Kannen von *Nepenthes melamphora* Reinw. mit besonderer Berücksichtigung der Nematoden. III. Harpacticiden als Bromeliaceenbewohner. [The microfauna of the Dutch East Indies. II. The microfauna content of the pitchers of *Nepenthes melamphora* Reinw. with especial consideration of the Nematodes. III. The Harpacticides as inhabitants of the Bromeliaceae.] *Treubia* 3: 116–126. 1922.—This article is of zoological interest except as it lists the fauna of *Nepenthes* and the Bromeliaceae.—*M. B. Church*.

1237. OYE, PAUL VAN. Les marais de la Province de l'Equateur. [The marshes of the equatorial provinces.] *Bull. Soc. Roy. Bot. Beligique* 56: (1–10). 1924.—The marshes of the region are described and discussed from a hygienic point of view. Mention is made of the relation between fishes and mosquito larvae and of the relative prominence of algal and animal groups. Suggestions are given on the introduction of fishes into the region. The author believes that conditions are very suitable for the growing of rice, and that the methods of cultivation ordinarily employed would automatically eliminate the stagnant water.—*L. H. Tiffany*.

1238. OYE, P. VAN. Sur l'écologie des épiphytes de la surface des troncs d'arbres à Java. [Ecology of the epiphytes on the surface of the trunks of trees in Java.] *Rev. Gén. Bot.* 36: 12–30, 68–83. 12 fig. 1924.—The epiphytes on trunks of trees may be divided biologically into 3 groups: (1) Those found in a bright and dry environment—the lichens and *Trentepohlia*; (2) those in a humid and shady environment—the Myxophyceae and the mosses; (3) those more or less indifferent to climatic conditions but more dependent on anchorage and food—chiefly the epiphytic higher plants. *Drymoglossum* has an intermediate and special position.—The general morphology of the outside of the trunk, the surface and crown of the trees are determining factors dividing trees into 2 groups: (1) with unbranched and (2) with branched trunks. These groups are further subdivided; the 1st into 3, the 2nd into 2 sub-groups. Those trees with smooth trunks and with leaves so arranged that the rain-water does not run down the trunk have their surfaces inhabited entirely by lichens. The rough-surfaced trunks are subdivided in their turn into 3 groups: (a) those whose leaves allow the water to trickle down the trunk as in the cocoa-tree—their surface is invaded by Myxophyceae and mosses; (b) those which have the crown so fashioned that the water cannot trickle down the trunk as in *Areca catechu* where the surface is normally covered by lichens and *Trentepohlia*; (c) those with a protected trunk conserving the water in the leaf bases as in *Arenca saccharifera* where the trunk is usually covered by ferns and orchids.—Trees with branched trunks may be classed as (a) evergreen with (1) foliage permitting light penetration and trunks variously related to rainfall and (2) foliage too dense for light to penetrate and hence with no epiphytes; and (b) deciduous, possessing as a rule no epiphytes because of the rapid variations in the environment.—The ecologic factors which influence the development of epiphytes in Java are the same for all groups of trees, namely humidity and light. The epiphytes appear in a definite order: the Myxophyceae and *Trentepohlia* represent the 1st stage of epiphytic invasion; the mosses and *Drymoglossum*, the 2nd; and the ferns and orchids, the 3rd.—*J. C. Gilman*.

1239. PAULSON, ROBERT. Tree Mycorrhiza. *Trans. British Mycol. Soc.* 9: 213–218. Pl. 11–12. 1924.—Ectotrophic mycorrhizas were found abundantly on roots of *Quercus robur*, *Fagus sylvatica*, *Carpinus Betulus*, *Betula alba*, *Castanea sativa*, *Pinus sylvestris* and *Taxus baccata*. They develop mostly on the superficial roots in layers of decaying leaves or moss. They are killed by drought periods and do not reappear until a new crop of rootlets has developed. Mycorrhizas have been observed to develop within a period of 10 days. A white slightly shaggy mycorrhiza on birch is believed to be caused by *Amanita muscaria*. Birch seedlings whose whole root systems are mycorrhizal show no evidence of injury and the author is inclined to believe that both the fungus and the higher plant derive some benefit from the symbiotic relation.—*W. B. McDougall*.



1240. PETCH, T. Gregarious flowering. Ann. Roy. Bot. Gard. Peradeniya. 9: 101-117. 1924.—Evidence is presented to show that *Corypha umbraculifera* is monocarpic, reaches maturity in 38-43 years and that considerable numbers of individuals flower simultaneously in Ceylon every few years. *Dendrocalamus giganteus* is shown to have neither the monocarpic nor the gregarious flowering habit. *Strobilanthes* spp. growing as small trees in Ceylon occupy large tracts in the hill country and flower simultaneously at intervals of 12 years, dying immediately afterwards and being replaced by seedlings. The different areas occupied by these plants may be arranged in 2 series each area maintaining its 12 year cycle but with an interval of 5 or 7 years between the general flowering of the 2 series. This has caused the erroneous assumption that *S. sexennis* flowered every 6 years. The situation is still further complicated by the record of *S. viscosus* flowering at intervals of 8 years at Peradeniya. It has been impossible to connect any of this flowering with external factors.—Geo. D. Fuller.

1241. ROBERTSON, CHARLES. Flowers and insects. XXIII. Bot. Gaz. 78: 68-84. 1924.—In this paper, one of an extended series, the author presents data on the frequency of the members of the various insect orders on certain flowers. Numerous examples of imperfect adaptation of flowers are cited in which certain insects may take the nectar without pollinating the stigmas. Under "Characteristics of insect flowers" the author discusses nectar glands, modifications which protect the pollen, and color. The case of a hawk moth visiting the white flowers but avoiding the purple ones in a mixed petunia bed is cited.—B. W. Wells.

1242. SHELTON, W. E. Xerophytism in the Swan River district. Jour. and Proc. Roy. Soc. Western Australia 7: 95-107. Pl. 15-17. 1921.—The character of the tissues of the leaves of *Banksia attenuata*, *Dryandra floribunda*, *Ammophila arundinacea*, *Xanthorrhoea Preissii* and their adaptation are discussed.—Wm. Randolph Taylor.

1243. STEVENS, O. A. Perennial sow thistle. Growth and reproduction. North Dakota Agric. Exp. Sta. Bull. 181. 1-44. 28 fig. 1924.—Both *Sonchus arvensis* and the variety *glabrescens* are found in North Dakota, the latter the more commonly. Seed scarcely germinate at 68°F. but germinate readily when alternated daily between high (90°) and lower temperatures. Seedlings become established with difficulty in bare soil except under very favorable moisture conditions. Establishment in soil partly covered, as with grass or weeds, is less difficult. Vegetative propagation occurs by thickened horizontal and vertical roots. Root lengths of 6 mm. will establish plants which may produce flowers 3 months from buds. A root 45 inches long bore 42 buds and bud sprouts. Fruits mature from the blossom stage on pulled plants when protected, as when piled in heaps.—Cross pollination is necessary for seed production. Upon 1 square yard in an area having 30 fruits per head it was estimated that 50,000 fruit were produced.—L. R. Waldron.

1244. TSCHIRCH, A. Tier und Pflanze ihren gegenseitigen Beziehungen zueinander. [Animals and plants in their mutual relationships.] Mitteil. Naturf. Ges. Bern. 1923: 19-31. 2 fig. 1924.—The author emphasizes the frequency of symbiosis between animals and plants. The combination of fungi or bacteria with animals is not incidental but normal, asymbiosis being the exception. Cases are mentioned where bacteria or fungi appear symbiotically in animals. This can be considered symbiosis only if both partners preserve their independence, for if the animal cannot live without its symbiont partner, then the combination of the 2 organisms represents the synthesis of a new organism of higher order. The 2 organisms must be physiologically balanced. Symbiotic plants living in animals may function chemically either by producing substances which are transmitted to and used by the animal, or by stimulating reactions in the animal body which lead to the formation of compounds vitally important to the animal's life. The plant may form or may stimulate the formation of enzymes, hormones or vitamins. It may form in the animal body cyclic compounds which the animal alone could not produce, and thus the plants may be considered organs of inner secretion for the animal. The formation of laccainic acid through the action of chromogenic yeasts in the body cavity of *Tachardia lacca* Kerr is described in detail and other examples are cited.—S. Blumer.

1245. Заленский, В. [ZALENSKI, V.] О признаках ксерофилии у растений юго-Востока. [Symptoms of xerophily in the vegetation of southeastern Russia.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 63-64. 1921.—So-called

xerophytes should be divided into a series of biological groups: (1) succulents with a small root system, low osmotic pressure, small conducting system and large but sparsely distributed stomata; (2) a group having large root systems which cannot endure deficiency of water, and showing no xeromorphism; and (3) non-succulent plants having small root systems and a rest period during the summer. In southeastern Russia many forms have 2 rest periods with 2 maxima of osmotic pressure, one in the winter and a higher one in the summer. Plants of southwestern Russia and western Europe have only 1 winter rest-period. Southeastern Russia is characterized by winter forms and winter annuals. Investigations of the transpiration of xeromorphic forms have shown that xeromorphism is often not connected with low transpiration. On the contrary, non-xeromorphic species have a low transpiration and among them may be found drought-resisting species. This is confirmed by observations on *Atropa Belladonna*, *Valeriana officinalis*, *Vicia picta*, etc., which can endure heat and drought of the South-East, while many of the native xerophytes dry up.—*V. Malchevski*.

### FLORISTICS

1246. ANONYMOUS. *A philosophical local flora*. [Rev. of: ANONYMOUS [Aberdeen University Committee.] *James William Helenus Trail: a memorial volume*. xi + 331 + [56] p. Aberdeen Univ. Press: Aberdeen, 1923.] *Nature* 113: 636-637. 1924.—The "Flora of the City Parish of Aberdeen," comprising the bulk of the volume, includes the careful observations of Prof. Trail over a period of 50 years. It will be of special interest to any one studying changes of a flora over a period of years. The committee has revised the introduction and added a biography and chronological bibliography.—*O. A. Stevens*.

1247. ALEXANDER, W. B. *Excursion to Garden Island*. *Jour. and Proc. Roy. Soc. Western Australia* 6: 54-56. 1920.—Plants observed are discussed.—*Wm. Randolph Taylor*.

1248. ALEXANDER, W. B. *Excursion to Lesmurdie Falls*. *Jour. and Proc. Roy. Soc. Western Australia* 6: 52-53. 1920.—Plants observed are discussed.—*Wm. Randolph Taylor*.

1249. ALEXANDER, W. B. *Excursion to Perry's lime kilns*. *Jour. and Proc. Roy. Soc. Western Australia* 6: 29-50. 1920.—Plants observed are discussed.—*Wm. Randolph Taylor*.

1250. CHERMEZON, H. *La flore cypérologique de Madagascar*. [The Cyperaceae of Madagascar.] *Bull. Soc. Linn. Normandie* 7e Sér. 6: 53-100. 1923.—The distribution of the Cyperaceae in the island is discussed. Of the 302 species half are endemic although no genus is endemic. They show a strong affinity with the flora of eastern Africa and are but slightly related to Asiatic forms.—*Geo. D. Fuller*.

1251. CRISPO, H. M. *Excursion to Lugarno ferry*. *Australian Nat.* 5: 174-177. 1924.—The observations of a botanical naturalist on a day's walk are given.—*T. C. Frye*.

1252. HARRIS, T. Y. *Excursion to Edwards beach*. *Australian Nat.* 5: 190-191. 1924.—Certain angiosperms and marine algae were observed.—*T. C. Frye*.

1253. HARRIS, T. Y. *Excursion to Engadine*. *Australian Nat.* 5: 177-179. 1924.—This is chiefly a list of the species of plants observed on a 1-day trip.—*T. C. Frye*.

1254. HERBERT, D. A. *Excursion to Greenmount*. *Jour. and Proc. Roy. Soc. Western Australia* 6: 53-54. 1920.—Plants observed are discussed.—*Wm. Randolph Taylor*.

1255. HERBERT, D. A. *Excursion to Lake Yangebup*. *Jour. and Proc. Roy. Soc. Western Australia* 6: 49-50. 1920.—Plants observed are discussed.—*Wm. Randolph Taylor*.

1256. HERRING, P. *Fosdalens Roser*. [Roser of Fosdalen.] *Bot. Tidsskr.* 38: 201-216. 1924.—A systematic and historical account of the genus is given.—*A. L. Bakke*.

1257. HITCHCOCK, A. S. *Grasses of British Guiana*. *Jour. Bd. Agric. British Guiana* 16: 31-39. 1923.—A list of the 169 species of grasses found in British Guiana is given of which about 29% have been introduced and are found in the vicinity of settlements. The grasses are listed according to habitat.—*J. P. Jones*.

1258. HOLDHAUS, KARL. *Das Tyrrhenisproblem*. *Zoogeographische Untersuchungen unter besonderer Berücksichtigung der Koleopteren*. [The Tyrrhenian problem. Zoogeographical investigations with special reference to the Coleoptera.] *Ann. Naturhist. Mus. Wien* 37: 1-200. 1924.—The discussion concerns the distribution of life on the lands surrounding the Tyrrhenian Sea as illustrated by the beetles. One part (page 185) is devoted to the distribution of plants.—*A. S. Hitchcock*.



1259. HOLLOWAY, J. E. *Studies in the New Zealand Hymenophyllaceae. Part 2. The distribution of the species throughout the New Zealand biological region.* Trans. and Proc. New Zealand Inst. 55: 67-94. 4 maps. 1924.—East of the Southern Alps the number of rainy days is less than in Westland, and in at least part of Canterbury an excessively dry wind is an intermittent, but characteristic, feature. This lower and more variable humidity causes a more restricted flora of Hymenophyllaceae. On the eastern flanks of the Southern Alps there is a continuous covering almost purely of *Nothofagus cliffortioides*. The trunks of these are not favorable for the attachment of epiphytes. *Hymenophyllum villosum* is fairly abundant among the moss and as a low epiphyte. *H. multifidum*, *H. flabellatum* and *T. rarum* are scantily or rarely present, on rocks or overhung places. In the Intermediate Montane Area, the *Nothofagus* is present only in patches, the major part of the area being covered with tussock grass shrubs and subalpine herbs. Only *H. villosum* is present, on the ground by creek sides. Of the Eastern outlying mountains 3 are considered. At Mount Oxford the forest is of *N. cliffortioides*, with an undergrowth of saplings and a few shrubs of other species, and with *Araliads*, *Alsophila* and *Cyathea* in the stream gullies. *H. villosum* and *H. multifidum* are abundant on the walls of the main lateral gullies, rarely on the floor of the terrace forest. *H. sanguinolentum* is the only lowland species present, in 1 or 2 especially damp places. *H. peltatum* is not uncommon on boulders and in rocky gullies. Specimens of *H. minimum* and *H. Tunbridgense* have been secured in since-denuded portions of this area. The Mount Peel forest is more humid than the Mt. Oxford. *H. villosum*, *H. multifidum*, and *H. peltatum* are present abundantly as epiphytes as well as terrestrial forms. *H. sanguinolentum* is present and occasionally epiphytic, and *H. demissum* is frequent on the ground. Most important is the presence of *H. pulcherrimum* and *H. scabrum*, both abundant within limited areas. *H. flabellatum* is present on the bases of *Hemitelia Smithii* stems. In the Mount Studholme area the forest is mostly lowland. From the lower end of Kelsey's Valley there is the same general epiphytic fern flora as in Peel Forest. In the lower 3rd of the valley *Hymenophyllum sanguinolentum*, *H. australe* and *H. Tunbridgense* mark this as a lowland territory. Further up, the shrubbery closes in with greater humidity and *H. villosum*, and *H. peltatum* are predominant. The forests of the Banks Peninsula have nearly all been destroyed, but records indicate that the filmy fern flora was very rich, especially in *Trichomanes*. On South Island near Dunedin there is greater abundance of Hymenophyllaceae and a more epiphytic tendency than in Canterbury. On Stewart Island the tendency is more to the Westland than the Dunedin type of vegetation. The South Island Northwestern Botanical District has both *Taxad* and *Nothofagus* forests. In the former there is an abundant filmy fern flora, with many sporelings and prothallia; the latter is less rich. In the Northeastern Botanical District there is a frequent dry southwest wind. East of Nelson the forest is of *Nothofagus* with the lowland species ascending higher than in Westland. On the North Island the lowland species attain a notably high altitude. Some species reach here their northern limit, as *H. pulcherrimum*, *H. peltatum*, *H. Malingii* and *H. rufescens* on Te Aroha Mountain; *H. villosum* on Mount Te Mochan; and *T. Colensoi* in ravines near Rotorua. On the Kermadec Islands *H. demissum* is abundant; *H. flabellatum* and *T. humile* are rare. *T. venosum* is present on *Cyathea*. The Chatham Islands have *H. bivalve*, *H. demissum*, *H. dilatatum*, *H. australe*, *H. flabellatum*, *T. reniforme*, *T. venosum* and *T. multifidum*. The Auckland Island rata forest contains *H. rarum*, *H. sanguinolentum*, *H. villosum*, *H. dilatatum*, *H. bivalve*, *H. demissum*, *H. flabellatum*, *H. minimum*, *H. Tunbridgense*, *H. multifidum* and lacks notably *Trichomanes*. On Campbell Island there is no forest, but *H. villosum* and *H. multifidum* are present. On the Antipodes Island *H. multifidum* has been found, but on Macquarie Island there are no woody plants and no filmy ferns.—Wm. Randolph Taylor.

1260. LÜDI, W. *Neufunde aus dem Gebiet des Napfs.* [Discoveries from the district of Napf.] (Abstract.) Mitteil. Naturf. Ges. Bern 1923: LVIII-LIX. 1924.—The author gives a list of alpine vascular plants which were found around Napf in the region of the foothills of Bern.—S. Blumer.

1261. MÜLLER, H. *Die Algenvegetation der Kerrenfelder des Sigiswilergrates.* [The algal vegetation in the limestone gulleys of the Sigiswileridge.] (Abstract.) Mitteil. Naturf. Ges. Bern. 1923: XIV-XVI. 1924.—In the calcite veins of the lithothamian limestone

the author found a lime-dissolving endolithic alga, *Alphanocapsa*, similar to *A. virescens*. The dissolution of the limestone veins is primarily caused by *Cocobotrrys verrucariae* Chodat. In fissures, the following species appear: *Nostoc punctiforme* (Kütz.) Hariot, *Pleurocapsa saloensis* Chodat, *Pleurococcus vulgaris* Menegh., *Cystococcus humicola*, and *Stigonema sinutum* (Ag.) Hass. After the algae have disintegrated the surface of the rocks, lichens appear and later the protonema of mosses. Into the fissures filled by algae the rhizoids of mosses penetrate, especially those of *Tortella tortuosa* whose small cushions collect humus and afford a substratum for hardy seed plants.—*S. Blumer*.

1262. NORTON, A. H. Some of the more conspicuous plants of Mt. Ktaadn. Maine Nat. 4: 77-82. 1924.—This is a "brief review of a few of the more conspicuous plants" of the upper 3000 feet of Mt. Ktaadn. Untechnical notes as to growth-forms are given.—*C. A. Weatherby*.

1263. PAMMEL, L. H. A day near Muskogee, Oklahoma. Proc. Iowa Acad. Sci. 30: 295-296. 1923 [1924].—Lists of plants are given for a prairie region with deep erosion valleys and hills of sand and of limestone.—*H. S. Conard*.

1264. PAMMEL, L. H. Notes on the flora of Yosemite and adjacent regions. Proc. Iowa Acad. Sci. 29: 245-255. 1922 [1924].—A cursory account of the region is given, with many plants named in relation to locality and habitat.—*H. S. Conard*.

1265. PAMMEL, L. H. The flora of Pine Hollow, Dubuque County, Iowa. Proc. Iowa Acad. Sci. 30: 263-277. 1923 [1924].—It contains a topographic and ecologic description of the area, which is notable for the abundance and splendid reproduction of *Pinus Strobus*. A catalog of plants follows.—*H. S. Conard*.

1266. PAMMEL, L. H. The occurrence of *Juniperus horizontalis* in Floyd County near Rockford. Proc. Iowa Acad. Sci. 30: 297-300. 1923 [1924].—The shrub covers about 10 acres of shaly prairie hills, far southwest of its hitherto known range. The range of the species is discussed, and a list of accompanying plants is given.—*H. S. Conard*.

1267. PAMMEL, L. H., AND R. I. CRATTY. Some notes on plants of Whitehall, Michigan. Proc. Iowa Acad. Sci. 30: 279-285. 1923 [1924].—A sand dune region is briefly described and a list of vascular plants given.—*H. S. Conard*.

1268. PEASE, ARTHUR S. Vascular flora of Coös County, New Hampshire [U. S. A.] Proc. Boston Soc. Nat. Hist. 37: 39-388. Pl. 5-11. 1924.—This is the largest and northernmost of the counties of New Hampshire and is of special interest because of its mountainous character, having in the Presidential Range of the White Mountains several peaks above 5,000 feet. The highest, Mt. Washington, reaches an elevation of 6,293 feet. This makes it the most notable of all the alpine areas in eastern North America. This report considers the hydrography, orography, soils, climate, floristic conditions, history of botanical investigations and an extensively annotated list of species. A rather complete bibliography is included.—*Geo. D. Fuller*.

1269. PETRESCO, C. Remarques sur quelques plantes intéressantes la Flore de Moldavie. [Some interesting plants of the flora of Moldavia.] Ann. Sci. Univ. Jassy 11: 132-134. 1921.—The author points out the introduction and spread in eastern Rumania of some foreign species, as *Matricaria discoidea* D. C., *Chenopodium botrys* L., *C. foetidum* Schrad., *Diploaxis ramosissima* Spreng, etc.—*Al. Borza*.

1270. PITCHER, F. Excursion to Sherbrooke. Victoria Nat. 41: 4-6. 1924.—Notable plants observed are listed, and especial mention is accorded the list of 26 ferns.—*Wm. Randolph Taylor*.

1271. REAGAN, ALBERT B. The flora of the Olympic Peninsula, Washington. Proc. Iowa Acad. Sci. 30: 201-243. 1923 [1924].—Annotated lists are given of 4 algae, 19 Polypodiaceae, 3 equisetes, 3 lycopods, 1 Selaginella, 15 gymnosperms and 651 angiosperms.—*H. S. Conard*.

1272. ROSENKRANZ, F. Über ein eigenartiges Vorkommen der Schwarzföhre, *Pinus nigra* in Niederösterreich. [An extraordinary station of *Pinus nigra* in Lower-Austria.] Oesterreich. Bot. Zeitschr. 73: 110-118. 1924.

1273. SCHROETTER, HERMAN V. Equisse de géographie et de balnéologie de la mer Mort, avec remarques concernant la flore du littoral de cette mer. [The physical geography and balneology of the Dead Sea with remarks on its littoral flora.] La Géographie 42: 162-210.



1924.—There is here a brief sketch of some of the xerophytic and halophytic vegetation of the region.—*Geo. D. Fuller.*

1274. SCHULZ, ELLEN D. *500 wild flowers of San Antonio [Texas] and vicinity.* 271 p., 21 pl., 1 map. Pub. by the author: San Antonio, Texas. 1922.—This is a manual of the flora of the San Antonio region, written in popular style. The keys are based largely on vegetative characters. The location, physiographic features, climate, and distribution of plants over the area are briefly treated in the introduction. Old Mexican and Indian names are recorded in the descriptions when possible. The 41 original photographs add greatly to the value of the book.—*M. B. Morgan.*

1275. SETCHELL, WILLIAM ALBERT. *Ruppia and its environmental factors.* Proc. Nation. Acad. Sci. [U. S. A.] 10: 286–288. 1924.—*Ruppia maritima* L. is a variable brackish-water plant classified under 1 or 2 species and variously subdivided into subspecies, etc. *Ruppia* at 2 stations exposed to tidal changes in water level, on Richardsons bay, California, was perennial; it had long, coiled peduncles, and mainly stout, nearly symmetrical fruits; this form seemed to be var. *longipes* Hagström; in cultures in a heated and strongly lighted room, it grew all the year and bloomed fairly freely, but set little fruit. At 9 stations in shallow pools reached by high tide, *Ruppia* died down in late winter; this form, apparently var. *rostrata* Agardh, had short, recurved peduncles, and fruits mostly narrow, flattened and curved; in cultures it was perennial, and bloomed and fruited abundantly. Each form produced a few fruits of the shape characteristic of the other form. The cultures indicate that *Ruppia maritima* is adapted to a wider range of salinity, pH, and light duration than occur at the stations observed; the temperature range is about 15°–20°C. for germination and about 20°–25°C. for later vegetative growth and reproduction.—*Howard B. Frost.*

1276. SVEDELIUS, NILS. *On the discontinuous geographical distribution of some tropical and subtropical marine algae.* Arkiv. Botanik 19<sup>3</sup>: (1–70). 1924.—The author comments on the unsatisfactory character of our present knowledge of this problem and cites his explanation, given in 1905, of the similarity of the West Indian and the Indo-Pacific floras based on the evidence that the Pacific Ocean and the Caribbean Sea were formerly continuous. He gives details, supported by maps, which favor this hypothesis and presents similar evidence that the Mediterranean, during Tertiary times, received several forms through an open connection with the Indian Ocean.—*Geo. D. Fuller.*

1277. WIINSTEDT, KNUD. *Juncus tenuis* Willd i Danmark. [*Juncus Tenius* Willd in Denmark.] Bot. Tidsskr. 38: 177–179. 1924.—This plant, introduced from South and North America, was 1st reported in Denmark in 1843. Since then it has become generally distributed.—*A. L. Bakke.*

1278. WYLIE, R. B. *Notes on introduced plants.* Proc. Iowa Acad. Sci. 30: 333–336. 1923 [1924].—The troublesome inroads in the Fiji Islands of *Mimosa pudica*, *Panicum barbinode*, *Lantana* sp., *Pisidium Guajava*, and *Clidemia hirta* are described.—*H. S. Conard.*

## VEGETATION

1279. ALLAN, H. H. *The forest remnants in the neighborhood of Feilding.* (Abstract) Rept. Australasian Assoc. Adv. Sci. 16: 402–404. 1923.

1280. BÖRGESSEN, F. C. E. *On the vegetation of the Virgin Islands of the United States formerly the Danish West Indies.* 12 p. Govt. Print. Office: St. Thomas, 1923.—Among the types of vegetation described the principal are: (1) the coast vegetation of mangroves; (2) the strand vegetation with *Ipomaea pes caprae*, *Coccoloba wifera* and *Hippomane mancinella* as dominant species; (3) a thicket association of shrubs which include *Croton* spp., *Lantana* spp., *Acacia* spp. and *Gossypium barbadensis*; and (4) the forest association with a mixture of deciduous and evergreen trees. *Ceiba pentandra*, *Ficus pedunculata* and *Clusia rosea* are abundant trees on whose branches a few epiphytic orchids and numerous bromeliaceous plants are found. The Myrtaceae are well represented among the smaller trees and shrubs while the genera *Vitis*, *Cissus* and *Convolvulus* provide numerous lianas. Ferns and monocotyledons are very abundant in the herbaceous undergrowth.—*Geo. D. Fuller.*

1281. CLEMENTS, F. E. *The original vegetation of Death Valley.* Carnegie Inst. Wash-

ington Year Book 22: 317. 1924.—Probably the grassland climax occupied Death Valley "before the last dry phase, which permitted the entrance of the *Larrea-Franseria* climax."—*B. E. Livingston.*

1282. HORT, ARTHUR F. Some Pyrenean plants at home. Jour. Roy. Hort. Soc. 49: 185-190. 1924.—This is a semi-popular description of the woodland plants of parts of the Pyrenees at 2000-3000 m. during the spring. Among the notable plants are species of *Primula*, *Anemone*, *Scilla*, *Narcissus*, *Saxifraga*, and *Gentiana*.—*Geo. D. Fuller.*

1283. LUYTJES, A. De vloedbosschen in Atjeh. [Mangrove-swamps in Atjeh.] Tectona 16: 575-601. 2 fig. 1923.—In Atjeh, the northern part of Sumatra, the most important swamps are on the east coast with some of smaller extent on the west and north. They may be divided into 3 classes: (1) those wholly flooded at high tide, (2) those partially flooded at high tide, and (3) those flooded only at the highest tides. The stands in the 1st class regenerate easily, the 2nd class exhibits inferior stands somewhat difficult to regenerate while those of the 3rd class should not, in the writer's opinion, be considered as real mangrove swamps. Lists of species are given.—*Ch. Coster.*

1284. PRINTZ, HENDRIK. The vegetation of the Siberian-Mongolian frontiers [the Syansk region]. Contributiones ad Floram Asiae interioris pertinentes. Vol. 3. 458 p. 16 pl. 3 maps. Det Kongelige Norske Videnskabers Selskab: Trondhjem, 1921.—This 3rd volume of the series comprises an account of the vascular plants observed and collected by the author during the summer of 1914 on a journey in southern Siberia and northwestern Mongolia. This is the so-called Urjankai Country, a tract of land around the sources of the Yenisei River as yet almost unknown.—Part I discusses the general phytogeographical relations of the regions traversed, and including the Abakan region and adjacent Steppe areas; the Siberian Taiga and Urjankai regions and the Sayansk Mountains.—Part II enumerates and describes the vascular plants found, including pteridophytes, gymnosperms and angiosperms. Two literature indexes are included.—*Frederick V. Rand.*

1285. SHREVE, FORREST. Across the Sonoran desert. Bull. Torrey Bot. Club 51: 283-293. 3 fig. 1924.—A general description is given of the vegetation of the Sonoran Desert extending from southwestern Arizona into the Mexican state of Sonora for about 300 miles. Conditions of rainfall and temperature are discussed and names of many of the characteristic plant species are given.—*P. A. Munz.*

1286. STANDLEY, PAUL C. The republic of Salvador. Smithsonian Rept. 1922: 309-328. 16 pl. 1924.—This general description of the smallest of the Central American republics contains a sketch of the vegetation. The climate is rather dry and the cultivation of coffee has replaced the native vegetation except on the mountain slopes. Here, evergreen trees of such families as the Leguminosae and Meliaceae, together with figs, are abundant and, with the relatively few tree ferns and palms, they form a rather rich tropical forest. Orchids are surpassed in abundance by bromeliads and aroids, while mangroves fringe the coast.—*Geo. D. Fuller.*

1287. STARK, PETER. Zur Entwicklungsgeschichte der badischen Bodenseemoore. I. Der edaphische Facieswechsel. II. Der klimatische Facieswechsel. [The developmental history of the moors of the Lake of Constance in Baden. I. The edaphic phase. II. The climatic phase.] Ber. Deutsch. Bot. Ges. 41: 361-373. 1923.—This succession of moors sketches the successional stages from the open water to the high moor stages (Hochmoorphase). This includes meadow and tree associations. The author stresses the fact that the succession is edaphic. In the 2nd section the part that climate has played in this succession is discussed. In the moor vegetation various algae, mosses, and flowering plants are considered as to their climatic relations. Evidence is also included from the accompanying shell-fish fauna. Especial emphasis is placed on pollen analysis.—*M. B. Morgan.*

1288. WARD, F. KINGDON. The flora of the upper Irrawaddy. Jour. Roy. Hort. Soc. 49: 148-156. 8 pl. 1924.—The region is forest covered except where it rises above tree limits on the Chinese frontier. The belts are (1) the Indo-Malay jungle (tropical rainforest) up to 4,000 feet, (2) temperate rainforest, 4,000 to 8,000 feet, (3) conifer and Rhododendron forest, 8,000-12,000 feet, (4) dense thickets of dwarf bamboo and (5) open alpine meadows. In the temperate rainforest *Magnolia*, *Schima*, *Castanea*, *Acer*, *Quercus*, *Castanopsis* and *Viburnum*



are found; while in the undergrowth are *Rhodendron*, *Euonymus*, *Rubus*, *Clematis*, and *Lonicera*, with an abundance of epiphytic orchids and ferns. In the next zone *Abies*, *Larix*, *Juniper* and *Pseudotsuga* are the principal tree-genera, with *Rhodendron* dominant among the shrubs and in sharp competition with the bamboos towards the upper limits of the forest. Many *Rhodendrons* and *Primulas* occur in the alpine region and notes on many species are given.—*Geo. D. Fuller*.

1289. WELLS, B. W. **Major plant communities of North Carolina.** North Carolina Agric. Exp. Sta. Tech. Bull. 25: 3-20. 14 fig. 1924.—This paper embodies the 1st attempt to outline the main vegetational features of North Carolina. The area is ecologically rich and comprises the following 11 major plant formations named after the dominant species in each: (1) *Uniola-Cakile*, (2) *Juncus-Spartina*, (3) *Typha-Scirpus*, (4) *Potamogeton-Nymphaea*, (5) *Ilex-Myrica*, (6) *Campulosus-Sarracenia*, (7) *Nyssa-Taxodium*, (8) *Quercus-Aristida*, (9) *Syntherisma-Erigeron-Andropogon*, (10) *Quercus-Acer-Pinus*, (11) *Abies-Picea*. The distribution, habitats, physiognomy, and successional relations of each formation are discussed.—*F. A. Wolf*.

1290. WYLIE, R. B. **Botanical notes on Fiji and New Zealand.** Proc. Iowa Acad. Sci. 39: 46-54. 1923 [1924].—An account is given of the University of Iowa expedition of 1922. Fiji presents a tropical rainforest with scattered trees and a very dense jungle of undergrowth. Tree ferns abound in the interior, and mangroves on the shore. The principal cultivated plants are banana, cocoanut-palm, breadfruit, papaya, mango, pineapple, tara, cassava, yam and sugar cane. New Zealand has chilly winters, but an evergreen vegetation. The country is mostly given over to grazing. Forests of *Podocarpus*, *Dacrydium*, and *Agathis australis* remain.—*H. S. Conard*.

## FORESTRY

W. N. SPARHAWK, *Editor*

(See also in this issue Entries 1148, 1153, 1161, 1162, 1172, 1200, 1201, 1211, 1213, 1217, 1220, 1225, 1238, 1239, 1259, 1265, 1272, 1279, 1280, 1283, 1286, 1288, 1289, 1290, 1509, 1544, 1550, 1551, 1552, 1677, 1685, 1706, 1714, 1717, 1737, 1738, 1748, 1823, 1838, 1873, 1882, 1942, 1979, 1999, 2059, 2086, 2093, 2094, 2097, 2098)

1291. ANONYMOUS. **Commerce d'importation et d'exportation des bois en 1921.** [Imports and exports of wood in 1921.] Bull. Soc. Centrale Forest. Belgique 30: 559-569. 1923.—Detailed tables show the exports and imports of forest products between Belgium and foreign countries. Imports dropped from 444 million francs in 1920 to 289 million francs in 1921, and exports decreased from 111 million to 62 million francs.—*H. T. Gisborne*.

1292. ANONYMOUS. **Some notes on the taungya system.** Australian Forest. Jour. 7: 102-105. 1924.—The "taungya" system of raising forest crops in conjunction with field crops is discussed with particular reference to Burmese conditions.—*C. F. Korstian*.

1293. ANONYMOUS. **The romance of sandalwood.** Australian Forest. Jour. 7: 126-128. 1924.

1294. ANTONIUS, HANS. **Eindrücke von slawonischer Eichenkultur.** [Impressions of Slavonian oak culture.] Forstwiss. Centralbl. 46: 400-402. 1924.—The large oaks for which Slavonia is famous are practically gone except in the southern part of the country, where there is only a 20 years' supply. The cause for their disappearance lies partly in political and economic reasons, and partly in the apparent soil impoverishment, leading to a falling off in rate of growth and greater susceptibility to disease. The soil fertility has been reduced by the prevalent "Waldfeldbau," raising corn and melons in young oak plantations, and by growing oak in pure stands (*Q. pedunculata* alone or mixed with *Q. cerris*). Many forest owners are planting ash, walnut, and poplar instead of oak, as these species will do well on the lowlands, which predominate.—*W. N. Sparhawk*.

1295. BURNS, GEORGE P. **Studies in tolerance of New England forest trees. IV. Minimum light requirement referred to a definite standard.** Vermont Agric. Exp. Sta. Bull. 235. 1-32. 4 pl., 2 fig., 12 graphs. 1923.—"(1) Tolerance in forestry literature expresses the reaction of a tree to all the factors of the site and any adequate study of tolerance requires that

each of the factors be given its true value. (2) Light is one of the factors of the habitat, and each of the species studied has a specific requirement for its minimum light intensity. (3) *Pinus ponderosa*, bull pine, requires the highest intensity, 30.6 milliamperes, of the several species studied, and *Acer saccharum*, hard maple, the lowest intensity, 3.4 milliamperes. The other 12 species require amounts lying between the two extremes. (4) Avoiding fractions it may be said that the minimum light requirement of each of the 14 species is: *Pinus ponderosa* (bull pine) 306; *Pinus sylvestris* (Scotch pine) 287; *Thuya occidentalis* (white cedar), 186; *Larix laricina* (tamarack) 176; *Pseudotsuga mucronata* (Douglas fir) 136; *Pinus murrayana* (lodgepole pine) 136; *Quercus rubra* (red oak) 133; *Celtis occidentalis* (hackberry) 115; *Picea Engelmannii* (Engelmann spruce) 106; *Pinus strobus* (white pine) 104; *Picea excelsa* (Norway spruce) 87; *Tsuga canadensis* (hemlock) 84; *Fagus grandifolia* (beech) 75; *Acer saccharum* (sugar maple) 34."—*Author's conclusions.*

1296. BUSSE. Blüten- und Fruchtbildung künstlich verletzter Kiefern. [Flowering and fructification of artificially injured pines.] Forstwiss. Centralbl. 46: 325-332. 1924.—Experimental plant breeding is rendered difficult in the case of forest trees by the time required to produce seed. To test the possibility of stimulating early fructification by wounding the tree, 5 plots were laid out in an 18-19 year-old plantation of *Pinus silvestris*, and treated as follows: On plot 1, the leaders of the current year were removed in early summer; on plot 2, the new growth on both leaders and side branches was removed; on plot 3, all roots at a 50 cm. radius from the stems were cut off by a sharp spade to the depth of the spade; on plot 4, both new shoots and roots were cut off, as in plots 2 and 3; plot 5 was left untouched, as a check. During the ensuing 3 years, 3 times as many trees bloomed on plot 2 as on plot 5, while only plot 4 fell below plot 5. Tests have not yet been made of the relative quality of the seed from the injured and uninjured trees. Although Plancke's investigations show that seed from pines bled for resin is inferior to that from unbled trees, which is just the opposite of Kienitz' observations, it may be that the trees investigated by Plancke were injured beyond the optimum point for stimulating reproduction and were in the early stages of death. His calculations are not at fault.—W. N. Sparhawk.

1297. CHAPMAN, HERMAN HAUPT. Forest mensuration. 2nd ed. xii + 557p. 88 fig. John Wiley & Sons, Inc: New York; Chapman & Hall Ltd.: London, 1924.—This is a comprehensive discussion of the measurement of the volume of timber, both standing and felled, and of the growth of individual trees and whole stands.—W. N. Sparhawk.

1298. D., G. Forêts et Démocratie. [Forests and democracy.] Bull. Soc. Centrale Forest. Belgique 30: 614-618. 1923.—The author bewails the lack of consistent and far-sighted forest policies by democratic governments, and describes the reasons for the forest policies in India and Great Britain.—H. T. Gisborne.

1299. D'ALVIELLA, FELIX G. Les peupliers et la restauration forestière. [Poplar and reforestation.] Bull. Soc. Centrale Forest. Belgique 30: 598-608. 1923.—The author has completed a study of the possibility of using poplars for reforesting lands devastated during the war. He asserts that the culture of poplar on a 45-year rotation will be more profitable than agriculture on the same land. *Populus monilifera* is recommended as the most desirable species, until more valuable trees can be introduced.—H. T. Gisborne.

1300. DELEVOY, G. La conservation des forêts coloniales. [Conservation of the colonial forests.] Bull. Soc. Centrale Forest. Belgique. 30: 525-542. 8 pl. 1923.—The causes of the deterioration and destruction of the French colonial forests in northern Africa are described in some detail, and means of protection are outlined. Although their extent has been exaggerated, the equatorial forests are more important than those in the temperate zone of Africa. Because of inadequate transportation facilities, they are now accessible in only a few places, and there they are being over-exploited and are deteriorating because of repeated cutting and recurrent fires. Without fire, cutover areas usually reforest naturally. The State should exercise strict supervision over exploitation of the forests so as to insure a future timber supply and maintain a forest cover, and studies must be made to provide the information upon which such regulation will be based.—H. T. Gisborne.

1301. DINGLER, MAX. Die Generationsfrage des grossen braunen Rüsselkäfers (*Hyllobius abietis* L.) [Length of the life cycle in the large brown weevil.] Forstwiss. Centralbl. 46:



485-492. 1924.—Various observers have found the life cycle, from egg to adult, ranging from 3-5 months to 15 months. To test Escherich's theory that temperature conditions are responsible for the variation, freshly cut pine sticks were buried in the ground where they would be attacked by the beetles, and were dug up and dissected at intervals between October and the following May, to determine the numbers of insects in various stages at each date. The greater number were found at 20-40 cm. below the surface of the ground, and 27% were already in the adult stage, the others being larvae. Neither eggs nor pupae can live over winter. One stick was kept in a thermostat at a constant temperature of 25°C., beginning February 8. Between Feb. 12 and 20, all of the adult beetles emerged; by March 4, all of the larvae had pupated; the 2nd series of adults, from these pupae, emerged between March 17 and April 1. Normally, these would not have appeared before August or September. It is evident that a certain degree of warmth can shorten the period of development by a whole winter, reducing the cycle from 2 years to 1. Meteorological records show that summer temperatures were above normal in the years and localities where 1-year cycles have been observed.—*W. N. Sparhawk.*

1302. ELLSWORTH, RODNEY SYDES. *The giant Sequoia*. 167 p. 12 pl. J. D. Berger: Oakland, California, 1924.—This deals in a popular way with *Sequoia gigantea*, particularly the Mariposa grove.—*W. N. Sparhawk.*

1303. ESCHERICH, K. *Die Forstentomologie in Schweden*. [Forest entomology in Sweden.] Forstwiss. Centralbl. 46: 437-447. 1924.—In Sweden, as elsewhere, it has been found that with increasing intensity of forest management the insect problem gains in importance. In 1915 an entomological laboratory was established at the Forest Exp. Sta., and in 1921 it was made an independent division with its own director. Ivar Trägårdh has been in charge of the work from the start, and he, his assistant, Paul Spessivtseff, and A. Kemner of the Agric. Exp. Sta. have accomplished much during the past 10 years. A list of their more important publications is given. The emphasis has shifted from purely biological studies to the more practical problems of forest hygiene, especially the study of insect epidemics and means of preventing them.—*W. N. Sparhawk.*

1304. GARDNER, C. A. *The forest formations of Western Australia: No. 5, the salmon gum forest*. Australian Forest. Jour. 7: 120-123. 1924.—The salient edaphic and vegetational features of the interior sand plain, or scrublands, are discussed.—*C. F. Korstian.*

1305. GOUDIE, H. A. *Tree planting*. Australian Forest. Jour. 7: 152-153. 1924.—The technique, advantages and disadvantages of several planting methods commonly employed are discussed.—*C. F. Korstian.*

1306. GRAY, W. W. *Afforestation through schools*. Australian Forest. Jour. 7: 89-91. 1924.—Considerable progress is reported in the establishment of forest plantations on idle lands for school endowment purposes.—*C. F. Korstian.*

1307. GREAT BRITAIN IMPERIAL INSTITUTE, COMMITTEE FOR INDIA. (Indian Trade Enquiry, Special Committee on timber and paper materials.) *Reports on timbers and paper materials*. xi + 57 p. John Murray: London, 1921.—The object of the inquiry was to investigate the possibility of increasing the use of Indian timbers and paper materials in the United Kingdom. Hitherto, Indian exports of timber other than teak have been small, and because of the large local requirements it is concluded that there is little possibility of increasing exports of structural timber. Certain hardwoods valuable for ornamental and special uses may be available for export, the most important being: *Pterocarpus dalbergioides* Roxb., *P. macrocarpus*, Kurz., *Dipterocarpus tuberculatus* Roxb., *Lagerstroemia Flos-reginae* Retz., *Hopea odorata* Roxb., *Dalbergia latifolia* Roxb., *D. sissoo* Roxb., *Cedrela toona* Roxb., *Terminalia tomentosa* Wight & Arn., *Heritiera minor* Roxb., *Shorea obtusa* Wall., *Pentacme suavis* A. D. C. (*Shorea siamensis* Miq.), and *Gmelina arborea* Roxb.—The world situation as to paper materials is briefly outlined. India, with a small local production, chiefly from sabai and munj grasses (*Ischaemum angustifolium* and *Saccharum munja*), depends largely upon imported pulp and paper. Native materials suitable for paper making include spruce and fir timber, which is mostly inaccessible, bamboos, and savannah grasses. The most suitable of the bamboos are *Bambusa arundinacea*, *B. tulda*, *B. polymorpha*, *Cephalostachyum pergracile*, and *Melocanna bambusoides*, constituting about 80% of the entire stand of bamboos in India.

The fiber of the 1st 4 is described as a pectoligno-cellulose, while *Melocanna* contains less pectose. The problems of penetration of the nodes by the digestive solutions and of economical bleaching are reported to have been solved. The best savannah grasses are *Anthistiria gigantea* (sub-spp. *arundinacea* and *villosa*), *Phragmites karka*, *Saccharum munja*, *S. arundinaceum*, *S. narenga*, *S. spontaneum*, and *Arundo donar*. The supply of bamboos and grasses is extremely large and easily renewed on short rotations. While a shortage of pulpwood supplies is not believed to be imminent, it is concluded that rising prices of wood will make it possible for India to market bamboo pulp in England, and at all events the local requirements should be filled by domestic products. As the grasses yield pulp generally inferior to that from esparto, they probably cannot compete with it unless costs of production and freight can be reduced enough for them to be sold at a lower price.—*W. N. Sparhawk*.

1308. GRIBKOWSKI, ERICH. Versuch einer Bestimmung des allgemeinen objectiven forstlichen Zinsfusses. [Determination of the general interest rate in forestry.] Forstwiss. Centralbl. 46: 297-317, 333-361. 1924.—There has always been a variety of opinions as to the correct rate of interest to use in forestry computations, and as to whether a uniform rate should be used, or different rates for different species. This is an attempt to determine the rate actually earned, in the following manner: The national requirements for wood were classified according to sizes needed, and from tables of yield (of oak, beech, pine, and spruce) by size-classes, the rotations which will produce the required proportions of various sizes were ascertained, assuming intensive silvicultural management with frequent, fairly heavy thinnings. Using standard graded yield tables and average pre-war prices for the different grades (size-classes), the percentage of increment in value was found to be 3.2 for oak at 130-140 years, 3.3 for beech at 110-120 years and for pine at 80-90 years, and 3.4 for spruce at 70-80 years. On a 3% basis these rotations give the highest net return from the soil, that is, the economic and financial rotations coincide. Furthermore, indicator-percentages (Weiserprocent) calculated by Pressler's formula are uniformly 3% at these ages for all 4 species. Detailed tables give the basis for the several calculations. The author concludes that a uniform standard rate of 3%, regardless of species, length of rotation, or method of management, is justified in all problems of forest valuation and statics.—*W. N. Sparhawk*.

1309. HOHENADL, W. Der Aufbau der Baumschäfte. [Formation of the boles of trees.] Forstwiss. Centralbl. 46: 460-470, 495-508. 1924.—The structure and form of the bole are the result of 2 sets of stimuli acting on the growing cells; (1) physiological needs for conducting water, food, and the products of metabolism, which lead to the formation of conducting tissues; (2) mechanical stimuli, principally the weight of the tree itself and pressure and tension caused by wind, which lead to the formation of supporting tissues. Mechanical, rather than physiological, factors influence the shape of the stem; otherwise, it would generally be cylindrical instead of tapering. The ring-porous wood of many broadleaved trees is ascribed to the fact that increasing weight of crown during the growing season results in the formation of supporting tissue toward the end of the season more than adequate for the crown after its leaves are shed. When growth starts in the following spring, the need for conducting tissue is great, while no additional supporting tissue is needed until after the leaves are entirely out. With evergreen trees the steady increase in weight requires the formation of supporting tissue throughout the season.—Diameters at different heights computed from the formula for a vertical column resisting a steady pressure (of its own weight, in this case) correspond very closely to the actual measured diameters of several trees, while the variations between actual and theoretical measurements can be easily explained by the fact that the stem of a tree is heterogeneous in structure. Changes in the shape of the crown, exposure to wind, natural pruning, and the transformation of sapwood into heartwood affect the mechanical stimuli and also the resisting strength of the wood, and thereby influence the form of bole. The influence of age and site factors on stem form is also attributed to purely mechanical causes.—*W. N. Sparhawk*.

1310. HOHENKERK, L. S. A review of the timber industry of British Guiana. Jour. Bd. Agric. British Guiana 16: 2-22. 1923.—This review deals with the area in forests, their composition, and the timber industry.—*J. P. Jones*.

1311. HUFNAGL, L. Wandlungen im Gebiete der Forsteinrichtung. [Changes in the



domain of forest management.] Wiener Allg. Forst- u. Jagdzeitg. 42: 157-158. 1924.—Modern forest regulation began by setting rotations and allotting the cut to separate annual felling areas. Although finally very complex, this system always adhered to the principle of regulating the cut on the basis of area. Mathematical formulae took the place of common sense and in an effort to make each area produce regularly the maximum amount of wood, fundamental silvicultural principles were lost sight of. Clean cutting, and even aged, pure stands became the rule. Recently a more natural system of handling the forests is coming into favor, in which regulation is based on growth rather than area.—*F. S. Baker.*

1312. KESSELL, S. L. Report of the forests department for the year ended 30th June, 1923. Ann. Prog. Rept. Woods and Forests Dept. Western Australia. 1923: 1-54. 1923.—This is the usual administrative report describing the general features of the year's work. The area of state forests was increased by the addition of 6,501 acres. The gross revenue for the year was £87,658, or £872 less than that for 1922. The general conclusions deduced from afforestation work to date are summarized.—*C. F. Korstian.*

1313. KESSELL, S. L. The damage caused by creeping fires in the forest. Western Australia Woods and Forests Dept. Bull. 33. 1-15. 1924.—The pros and cons of light burning are discussed. The preponderance of evidence is against the practice.—*C. F. Korstian.*

1314. L. [Rev. of: [BAVARIA.] STAATSMINISTERIUM DER FINANZEN, MINISTERIALFORST-ABTEILUNG. Forstatistischer Jahresbericht der Bayerischen Staatsforstverwaltung für 1913-1918. Heft 1. (Statistical report of the Bavarian State Forest Service for 1913-1918.) 24 p. J. Gotteswinter: Munich, 1924.] Forstwiss. Centralbl. 46: 398-400. 1924.

1315. LACHAUSSÉE, E. Le Président de La Joux est mort! [The President of La Joux is dead!] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 207-211. 2 pl., 1 fig. 1924.—The giant silver fir (*Abies pectinata*) of the forest of La Joux died in 1923. It was 60 m. high, 270 years old, 5 m. in circumference inside bark at breast height, and its total volume was 33.81 cu. m. A complete stem analysis is given, with diagram and figures showing volumes, products, costs and values.—*J. Kittredge, Jr.*

1316. LAFOSSE, M. Le charbon de bois. [Charcoal.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 192-199. 1924.—The consumption of forest-charcoal in France is only 75% as great as in 1861. Private owners who exploit their forests at the age of 20 years, when they produce chiefly small wood suitable for charcoal, suffer from the lack of demand because of the oversupply. Recently prices have risen as a result of Imbert's invention of a process whereby 15 kgm. of charcoal can be substituted for 20 l. of gasoline for driving motors. The economic possibilities of this change in France are discussed.—*J. Kittredge, Jr.*

1317. LEMMEL. Die forstpolitische Bedeutung des Eulenfrasses von 1924. [The economic significance of the owl-moth (*Noctua piniperda*) calamity of 1924.] Deutsch. Forstzeitg. 39: 903-909, 929-934. 1924.—The epidemic centered in 3 districts—Frankfurt (on Oder), Stettin, and Allenstein. About 170,000 hectares were entirely and 320,000 hectares partially defoliated, and although the degree of recovery has been high, it is estimated that 4,700,000 cu. m. must be cut in the State forests and 7,300,000 cu. m. in other forests. Of the total, 3,300,000 cu. m. will be mine-props and 4,600,000 construction timber. This is considerably below the amount of softwood timber normally imported. It may be possible to alleviate the situation by restricting imports, by reducing the cut in unaffected districts to partly balance the abnormal cutting of moth-killed timber, by reducing freight rates on such timber, by a moderate extension of credit, by widening the market through government purchase for public works, and by reduction of taxes on damaged forests.—*W. N. Sparhawk.*

1318. LESSEUX, C. DE. Extrait d'une notice de M. Sven Petrini, inspecteur des forêts en Suède. [Extracts from a report by Sven Petrini, forest inspector in Sweden.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 203-206. 1924.—The report deals with forest ownership, management, labor and transportation, exports, production and forest capital in Sweden. The total productive forest area of 23,540,541 hectares has an average stand of 61 cu. m. to the hectare with an average annual growth of 1.24 cu. m. The total annual growth is 29,225,000 cu. m. and the cut is 35,000,000 cu. m. The exports of forest products are rapidly diminishing, and it appears that the forests lack sufficient wood capital to maintain them.—*J. Kittredge, Jr.*

1319. LUBAN. *Zum Forleulenfrass*. [Concerning defoliation by the pine owl-moth.] Deutsch. Forstzeitg. 30: 959, 961. 1924.—It is claimed that gashing the trunks of defoliated trees, through the sapwood, will aid in their recovery by checking the too rapid rise of sap until the foliage recovers sufficiently to utilize it.—*W. N. Sparhawk*.

1320. MILLER, KARL. *Forstliches aus Rumänien*. [Notes on Rumanian forestry] Forstwiss. Centralbl. 46: 374-387, 420-432. 1924.—The forests and lumbering operations in the Carpathians are described. After leaving the foothills, where the original forest has long been replaced by a low cover of oak, birch, and alder brush, the forest is composed entirely of beech up to 1100 m. This is virgin forest with exceedingly dense stands averaging 30-35 m. in height. From 1100 to 1450 m. is a mixed forest of beech, spruce, and white fir, with occasional specimens of maple, elm, and ash. The fir reaches heights of 40-50 m., with occasional clear boles 40 m. long, while 1 ash measured 35 m. in height and 1.6 m. in diameter. Above this and extending to timber line at 1800 m. is pure spruce forest, almost uniformly 30 m. tall. Occasional specimens of pine (*P. silvestris*) and larch were noted.—Exploitation is practically confined to the spruce forest, and because of the extremely rough topography, necessitating heavy investments in logging equipment, clear cutting on a wide scale is considered the only practicable method. Logs are conveyed by cables for distances as great as 28 km. to a narrow gauge logging railroad, by which they are taken to the sawmill in the valley. There is much waste from leaving high stumps, from loss and breakage of logs along the cable-ways, and from decay, as many of the logs lie in the woods for 2 years after cutting. Many of the streams in the region already have been seriously affected by this denudation. The spruce restocks cutover areas within a short time and grows rapidly, if not prevented by grazing animals and by fires. The latter are frequent and destructive because of the great quantity of debris left after logging. Burns restock with *Epilobium* followed by light-seeded trees, such as aspen, willow, alder, etc., and after many years the conifers recover the ground.—The author predicts that systematic forest management will be impossible in the region for several generations, because (1) there is no shortage of wood; (2) the virgin forest must be removed before a managed forest can take its place; (3) the local population regards the forest as common property, free to all; (4) because of the thinly settled character of the region, law enforcement would be difficult; (5) general lack of efficiency; (6) uncertainty of tenure leads to a desire to convert into cash as quickly as possible the forests of the recently acquired territory; (7) the lumber companies can exercise political pressure and can also flood the market and bankrupt any attempt at State exploitation. He concludes that the forests of Eastern Europe, including Russia, are in the exploitation stage, and do not promise any opportunities for foresters.—*W. N. Sparhawk*.

1321. MOON, [FREDERICK] FRANKLIN, AND NELSON C. BROWN. *Elements of forestry*. 2nd ed. xvii + 409 p. 71 fig. John Wiley & Sons Inc.: New York; Chapman & Hall Ltd.: London, 1924.—This is a text-book of general scope, covering the whole field of forestry, with particular reference to the U. S. A.—*W. N. Sparhawk*.

1322. NOSSEK, E. A. *Das Bodenwertproblem und seine Lösung*. [The soil rent problem and its solution.] Wiener Allg. Forst- u. Jagdzeitg. 42: 163-166, 170-171, 176-178. 1924.—This article consists of the author's abstract of his forthcoming book, "Wert und Preis des Waldbodens im Lichte der neueren nationalökonomischen Theorien." (Value and prices of forest soils in the light of recent theories of national economics.)—*F. S. Baker*.

1323. PERRIN. *L'introduction du sapin pectiné aux basses altitudes*. [The introduction of *Abies pectinata* at low altitudes.] Bull. Soc. Centrale Forest. Belgique. 30: 645-655. 1923.—The following questions are discussed: (1) Why is it often desirable to grow fir rather than spruce, pines, and mixtures at low altitudes? (2) Where and under what conditions will the fir thrive? (3) What results have been obtained, and how may the fir be introduced?—*H. T. Gisborne*.

1324. PETRASCHKE. [Rev. of: HAUSKA, LEO, UND TEJRO MIURA. *Holzbrücken aus Rundträgern*. (Wooden bridges with round girders.) 2 pl., 19 fig. Karl Gerold: Vienna, 1924.] Forstwiss. Centralbl. 46: 396-398. 1924.—Formulae and tables are given to enable the ready computation of strength of wooden bridges.—*W. N. Sparhawk*.

1325. PROVIS, E. *A propos de gelees tardives*. [Concerning late frosts.] Bull. Soc.



Centrale Forest. Belgique 30: 543-555. 1923.—An explanation is given of the action of frost or freezing temperatures on living vegetable tissues. Ash, chestnut, locust, beech, fir, and oak are damaged by light spring frosts, spruce and maple are more resistant, and hornbeam, elm, poplar, alder, birch, and pine are most frost hardy. Species and age of trees, and surrounding conditions govern the consequences of frosts. Two kinds of frost (radiation and contact) are discussed with suggestions for their alleviation. Details are given regarding the occurrence of late frosts in the canton of Arlon from 1900 to 1920.—*H. T. Gisborne.*

1326. PRZEMETCHII, Z. *Impădurirea terenurilor neproductive*. [Afforestation of unproductive grounds.] Rev. Pădurilor [București] 34: 432-440. 1922.—*Robinia pseudoacacia* in combination with *Acer tataricum* is recommended for afforesting the steep slopes of ravines, introducing as an understory the shrubs *Rhus cotinus*, *Caragana arborescens*, *C. frutescens* and *Spiraea crenifolia*. The bottoms of ravines should be planted with *Salix viminalis*, *S. amygdalina* and *Populus nigra*. Moving sands may be fixed with *Salix acutifolia*, and also with *Pinus silvestris*, *P. taurica*, *Betula verrucosa*, *Populus tremula*, *P. alba*, *Robinia pseudoacacia*, or *Caragana arborescens*. On the downs, *Hippophae rhamnoides* may be planted, and on salt sands *Tamarix Pallasii* and *Rhus typhina*.—*Al. Borza.*

1327. PÜSTER. *Auenwirtschaft*. [Utilization of bottom lands.] Forstwiss. Centralbl. 46: 448-460. 1924.—Forest management on the low lands along the Rhine is described. Up to 1.1 m. above normal water level the land is occupied mostly by sedges, grasses, and willows, being too wet for other trees. The lower forest level, from 1.1 to 1.7 m. above the river, is subject to inundation for a considerable period nearly every year. Poplars (especially *P. alba*, *P. robusta*, and *P. deltoides*) and willows are grown on these sites, which also furnish pasturage. On land more than 1.7 m. above the water, which is overflowed only at times of unusual floods, the thickness of the silt determines the kinds of trees. Walnut and oak require 1.2 to 1.5 m. of silt above the underlying sand; ash must have at least 0.9 m.; elm, maple, beech, locust, and birch, 0.7 m.; poplars 0.4-0.5 m. Between 0.25 and 0.50 m. high forest does not pay and the land is used for alder coppice and basket willows, while soils with less than 0.25 m. of silt produce only a little grass and litter. The writer describes his 24 years' experience in converting a comparatively worthless forest, used only for producing fascines for river work, into a profitable forest of the above named species. Growth is exceedingly rapid, with rings frequently 2 cm. wide and annual volume increment as high as 25%.—*W. N. Sparhawk.*

1328. QUAIRIERE, C. J. *L'arboretum de Wychmael*. [The Wychmael arboretum.] Bull. Soc. Centrale Forest. Belgique 30: 585-597. 1923.—This arboretum, comprising 2 hectares of heather land at about 200 feet above sea level, was established in 1906 or 1907. It is divided into 2 compartments; one with 60 plots of about 1 are, each containing a single species, and the other with 12 plots of about 10 ares each, with mixtures of broadleaved and coniferous species. Each plot is described in considerable detail as it was in 1921.—*H. T. Gisborne.*

1329. R., E. *La sylviculture au Japon*. [Japanese silviculture.] Bull. Soc. Centrale Forest. Belgique 30: 609-614. 1923.—Data on the forest area, ownership, and growth are presented, with more detailed descriptions of the artificial and natural forests, reforestation, forest service, and silvicultural practice. The work of the Japanese Forest Experiment Station includes reforestation, utilization, forest meteorology, silviculture in relation to agriculture, tests of seed, and publication.—*H. T. Gisborne.*

1330. RÖSLER. *Betrachtungen über die Kahlschlagwirtschaft im Forstbetriebe*. [Observations on the clean cutting system.] Wiener Allg. Forst- u. Jagdzeitg. 41: 105. 1923.—This system is objectionable because smaller trees are cut before maturity; many young trees are destroyed; local site variations that favor a particular species are ignored; the stands suffer more from diseases, snowbreak and insects; and fir, a windfirm and deeprooted species with few insect enemies, is absent from the stand. Logging costs less when the stand is cut clean.—*F. S. Baker.*

1331. S. *Die Bedrohung des Waldlandes in Kärnten durch die Agräroperationen*. [Threats to the forests of Karinthia by agrarian reform.] Wiener Allg. Forst- u. Jagdzeitg. 41: 111. 1923.—An attempt is being made to eliminate servitudes (grazing) by allotting the lands among the servitude holders. As these lands run as high as 90% forested (mostly protection forest), the heavy cutting and devastation which would probably follow would be disastrous.—*F. S. Baker.*

1332. SCHAEFFER, A. *Sylviculture française en Amérique*. [French silviculture in America. Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 214-219. 1924.—The evolution of French methods of forest management from 1912 to 1922 is described. (A translation by T. S. WOOLSEY was published in the Journal of Forestry.)—*J. Kittredge, Jr.*

1333. SCHAEFFER, A. *Traitement du chêne*. [Silvicultural management of oak.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 199-202. 1924.—Natural regeneration of oak by group-selection cuttings, beginning with small openings and enlarging them as the young growth is established, the method advocated in Switzerland, is also applicable in eastern France. The method requires frequent cuttings and intensive management.—*J. Kittredge, Jr.*

1334. SCHLÖTTERER, JORG. *Zum 40 jährigen Bestehen der Hessischen Forstlichen Versuchsanstalt in Giessen*. [Forty years' work of the Hessian Forest Experiment Station at Giessen.] Forstwiss. Centralbl. 46: 405-420. 1924.—Founded in 1882 under the leadership of Hess, who was in charge until 1909, the work has been carried on by Hess, Schwappach, Nördlinger, Wimmenauer, Jacob Weber, Borgmann, and Wimmer. The principal projects have dealt with yields of pine, beech, oak, ash, and mixed stands; thinnings, pruning, form factors, bark volume, distribution of species, phenology, meteorological studies, introduction of exotics, source of seed studies, fertilizer experiments, and natural reproduction of pine, spruce, and oak. The technique of measuring volumes on sample plots, based on the Urich method, is described. A list of publications giving the results of the principal investigations is appended.—*W. N. Sparhawk.*

1335. SCHÜPFER. [Rev. of: BADEN. FORSTABTEILUNG DES FINANZ MINISTERIUMS (FOREST SERVICE OF BADEN.) *Hilfstabellen für Forst-Taxatoren*. (Foresters' tables.) Badenia: Karlsruhe, 1924.] Forstwiss. Centralbl. 46: 512-514. 1924.—Especial attention is called to the yield tables. Site classification is based on mean annual increment at 100 years, indicated in the field by age and average height, and the site classes are designated in terms of mean increment; for instance, if this is 13 cu. m. per hectare at 100 years, the site is 13. Furthermore, the tables indicate yields with different degrees of intensity of management, that is, according to whether intermediate yields are 20, 30, 40, 50, or 60% of the total yield. The amount of intermediate yield has a very great influence on the financial result of silviculture.—*W. N. Sparhawk.*

1336. SCHWAPPACH. [Rev. of: REBEL, [KARL]. *Waldbauliches aus Bayern*. (Bavarian silviculture.) Vol. 2. S. Huber: Diessen, 1924.] Deutsch. Forstzeitg. 39: 861-864. 1924.—Rebel's book shows clearly the evils resulting from political interference in forest management, such as is prevalent now in Bavaria and to some extent in other parts of Germany. For the last 40 years the yields in both volume and value of Bavarian forests have been diminishing. (See also Bot. Absts. 14, Entry 219.)—*W. N. Sparhawk.*

1337. SENTIS. *Stabilization du prix des bois*. [Stabilization of wood prices.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 211-214. 1924.—A proposal to stabilize French timber prices by regulating the amount of the cut from State forests is discussed.—*J. Kittredge, Jr.*

1338. TAROUCA, ERNST SILVA, UND CAMILLO SCHNEIDER. *Unsere Freiland-Nadelhölzer*. [Conifers for ornamental planting.] 2nd ed. xii + 315 p. 18 pl., 319 fig. Hölder-Pichler-Tempsky A. G.: Vienna; and G. Freytag: Leipzig. 1924.—All of the conifers known to grow in parks and gardens of central Europe are described, with notes on their cultural requirements, appearance, and value for cultivation. To facilitate the selection of species for given situations, lists are given classifying them according to light and moisture requirements, color of foliage, rapidity of growth and ultimate height, and other lists indicate the species of shrubby form, and those which stand severe trimming (for hedges). There is a systematic synopsis of the principal groups based on flowers and fruit, and a key to all genera based on twigs, buds, and foliage.—Special chapters include (1) the use of conifers in parks, by TAROUCA (2) their use in gardens, by SCHNEIDER; (3) Chinese conifers, by E. H. WILSON; (4) North American conifers, by ALFRED REHDER; (5) conifers adapted to far northern latitudes, by E. WOLF and W. KESSELRING; (6) exotic conifers suitable for forest planting in central Europe, by A. CIESLAR; (7) sexual and vegetative reproduction and subsequent cultivation, by FRANZ ZEMAN; (8) plant and animal enemies of conifers, by OTTO APPEL.—*W. N. Sparhawk.*



1339. THORNEWILL, A. S. Reflections on the timber imports into Southern Rhodesia. *Rhodesia Agric. Jour.* 21: 183-189. 2 fig. 1924.—The author discusses the world's timber situation and the approaching shortage. Rhodesia can satisfy all her own timber requirements, for the conditions are favorable, and the rate of growth is much greater than in Europe. The need is urgent for the immediate adoption of a forest policy.—*L. I. Goldblatt.*

1340. TUBEUF. [Rev. of: HERRMANN, E. *Tabelle zum Bestimmen der wichtigsten Holzgewächse des deutschen Waldes und einiger ausländischen angebauten Gehölze nach Blättern und Knospen, Holz und Samereien.* (Keys for identifying the more important German and some exotic woody plants.) 2nd ed. 76 p. 6 pl. J. Neumann: Neudamm, 1924.] *Forstwiss. Centralbl.* 46: 395. 1924.—Pith flecks, being pathological phenomena, are not reliable indicators, nor are the color terms used well known to everybody.—*W. N. Sparhawk.*

1341. VAN HORN, MAX W. Some conditions affecting tree growth as revealed by the annual rings. *Proc. Iowa Acad. Sci.* 30: 367-368. 1923 [1924].—Examination of stumps shows that the width of annual rings varies as follows: bur oak 0.25-0.33 inch; white oak 0.24-0.44 inch; hickory 0.18-0.32 inch; white elm 0.34-0.45 inch; silver maple 0.36-0.48 inch; honey locust 0.47-0.74 inch; wild cherry 0.6-0.94 inch. The relation between light and rate of growth is discussed.—*H. S. Conard.*

1342. VOLGER, K. Die Verjüngung der Buche, insbesondere das braunschweigische Schirmschlag-Femelschlagverfahren. [Reproduction of beech by the Brunswick shelterwood-groupcutting method.] *Forstwiss. Centralbl.* 46: 365-374. 2 fig. 1924.—While the humic acid resulting from a moderate layer of leaves favors the germination of beech, it is harmful to the seedlings, which also need more light and moisture than they get under a fully stocked stand. The cutting system described consists of shelterwood cutting over wide areas previous to a seed year, with a reproduction cutting during the seed year. Removal of the main stand is by cuttings in small groups, gradually enlarging the openings, especially in a southern direction, until they merge.—*W. N. Sparhawk.*

1343. WISCONSIN CONSERVATION COMMISSION. State parks of Wisconsin. Bull. 6. 32 p. 30 fig. 1 map. Madison, Wisconsin, 1922.—The location and natural features of the parks are described with rules governing their use. At least 1, the Peninsula Park in Door County, is to be handled as a productive forest on a sustained yield basis.—*W. N. Sparhawk.*

1344. WOBST. Reisebrief aus der Lüneburger Heide. [Notes from the Lüneburg Heath.] *Forstwiss. Centralbl.* 46: 474-477. 1924.—Spruce does well on the moister sites, and should be planted more extensively than at present. Birch thrives, but produces bushy trees valuable only for firewood. Oak is mostly a failure, while of exotic species only Douglas fir and *Pinus strobus* deserve consideration.—Poisonous gases from the chemical warfare establishment at Breloh destroyed trees, particularly pine, within a radius of 3 km. Spruce was less susceptible to gas injury.—*W. N. Sparhawk.*

## GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 1036, 1081, 1179, 1180, 1221, 1240, 1296, 1338, 1535, 1547, 1610, 1645, 1666, 1667, 1713, 1723, 1933, 1949, 1967, 2027, 2054)

1345. ANONYMOUS. [Rev. of: KELLOGG, VERNON L. *The mind and heredity.* vi + 108 p. Princeton Univ. Press: Princeton, 1923 (see Bot. Absts. 13, Entry 6566).] *Amer. Jour. Public Health* 14: 711. 1924.

1346. ANONYMOUS. [Rev. of: THOMSON, J. ARTHUR. *What is man?* x + 331 p. G. P. Putnam's Sons: New York, 1924.] *Amer. Jour. Public Health* 14: 712. 1924.

1347. ANONYMOUS. [Rev. of: WIGGAM, ALBERT EDWARD. *The new decalogue of science.* 303 p. The Bobbs-Merrill Co.: Indianapolis, 1923 (see Bot. Absts. 14, Entry 1492).] *Amer. Jour. Public Health* 14: 790. 1924.

1348. AGAR, W. E. Experiments with certain plumage colour and pattern factors in poultry. *Jour. Genetics* 14: 265-272. 1924.—The genes B (barring), S (silver), E<sup>m</sup> (extension of black pigment), and l (lacing) were studied in crosses between Rhode Island Reds × Barred

Rocks and Gold Laced Wyandottes  $\times$  Barred Rocks. The crossover value for the sex-linked genes *B* and *S* was found to be 35.7% in males from the Wyandotte cross. The crossover value in the Rhode Island Red cross was 46.4%. The latter figure is not considered dependable because of inaccuracy in identifying barred individuals with the  $e^m$  factor homozygous. Factor *B* restricts the distribution of pigment, either black or gold, to cross-parallel bars and is dominant to self black and to gold. Silver bars on the plumage are not due to the gene *S* because gold birds of the composition (*ss*) may be barred. Lacing is caused by a recessive gene (*l*) which is hypostatic to  $E^m$  and almost completely epistatic to *B*. Spangling appeared in 4 males out of 34 in a back-cross of (*R. I. R.*  $\times$  *B. R.*)  $\times$  *R. I. R.* A color called "chestnut" also appeared in several males and in a few females in *F*<sub>1</sub> and *F*<sub>2</sub> of the Rhode Island Red cross. This dark red pigmentation is distributed irregularly on back and wings. Females carrying the gene *S* may show the chestnut spotting. The mode of inheritance of this character was not determined.—*F. A. Hays.*

1349. AGETE, F. Oportunidades que ofrece el "Plant Breeding" en Cuba. [Plant breeding opportunities in Cuba.] Mem. Soc. Cubana Hist. Nat. "Félice Poey" 6: 59-63. 1924.—This is a popular discussion of plant breeding opportunities in Cuba.—*J. A. Faris.*

1350. ALLEN, E. Racial and familial cyclic inheritance and other evidence from the mouse concerning the cause of oestrous phenomena. Amer. Jour. Anat. 32: 293-304. 1923.—The author finds 2 common variations in the oestrous cycle which occur under uniform environmental conditions. Some evidence for racial differences and familial similarity in cycle length is presented, and the suggestion made that a genetic factor may be operating to determine, in part, cycle length. The author believes there is no evidence that the corpora lutea of oestrous bear any primary causative relation to oestrous phenomena in the mouse. He considers interstitial tissue too inconstant in mouse ovaries to receive serious consideration, and holds the follicles to be the most important source of ovarian influence on the genital tract, in the absence of pregnancy. Ovulation being the dividing line between the anabolic and katabolic phases of the cycle, the presence of the maturing ova in large follicles and their absence or atresia after ovulation is thought sufficient to explain the mechanism of the phenomena.—A hormone has been isolated from the ovarian follicle of hogs and cattle which, injected into previously spayed animals, causes typical oestrous changes. The author considers it probable that this hormone is produced by the maturing ova, or by follicle cells under the influence of ova. It is not species specific. The continuation of ovogenesis during sexual maturity is stressed as establishing a distinct age difference in successive generations of ova, accounting for their maturation at definite intervals.—*E. E. Jones.*

1351. ALLEN, E. The oestrous cycle in the mouse. Amer. Jour. Anat. 30: 297-371. 1922.—The presence of cornified cells in the vaginal smear is shown to be a more accurate indication of oestrous than external signs. The changes in the vaginal and uterine epithelium and in the oviduct are discussed by the author. Ovulation is found to be the dividing line between the anabolic and katabolic phases of the oestrous cycle. It is not always spontaneous in virgin or unmated mice. The average duration of the oestrous cycle is 4-6 days, differing in the color varieties used in the experiment. The author suggests that this may be due in part to a genetic factor, which may be linked with the determiner for coat color. Pregnancy may reduce the number of ova produced at ovulation following parturition. The function and structure of the corpora lutea of oestrous and pregnancy are discussed. It is concluded that the corpora lutea of oestrous have no primary causative relation to oestrous changes in the genital tract. The conclusion is drawn that the presence of the maturing ova in large follicles is the cause of proestrus and oestrous, and that the removal of ova at ovulation (or their atresia) is the primary cause of the degenerative changes of the metoestrus.—*E. E. Jones.*

1352. ALMQUIST, ERNST. Investigations on bacterial hybrids. Jour. Infect. Diseases 35: 341-346. Pl. 1. 1924.—Following the cultivation together of 2 or more different species of the colon-typoid group, new forms were observed. These differed in shape, size, pigmentation, method of propagation, and in agglutination reactions when cultivated for some periods of time at comparatively low temperatures (12-18°C.) on dry agar. It is believed that hybrids were produced. From observations of stained preparations it is believed that nucleae were found in the cells of the bacteria.—*R. L. Starkey.*



1353. ALMQUIST, ERNST. **The origin of constant species.** Jour. Bot. 62: 97-102. 1924.—New species may originate in several ways, as follows: (1) as in segregation homozygotes from natural hybrids, (2) as constant heterozygous hybrids in which seed are produced by apogamy or parthenogenesis, (3) by mutation giving rise to new forms. *Capsella Heegeri* is mentioned as a species of possible hybrid origin from *C. lata* × *C. turoniensis*, also *Oenothera Lamarckiana*. Certain species of *Hieracium*, *Alchemilla*, and *Taraxacum* are hybrids which are constant because of apogamy. Instances are cited of the occurrence of hybrid forms in places where the range of distinct species overlaps. New species derived from hybridization of old species are more numerous among perennials and plants propagated asexually than among annual plants. The theories of Linneus, Jordan, and Darwin regarding the origin of species are mentioned.—*J. L. Collins.*

1354. B., C. A. **Cane breeding in Hawaii.** Internat. Sugar Jour. 26: 245-249. 1924.—It is pointed out that each country must rely more and more on its own work in producing seedling canes adapted to its various soil, climatic, and other conditions. The author believes that Hawaii, with its widely varied conditions, is an especially suitable location for an up-to-date cane breeding station, and discusses from a suggestive standpoint the location, work, organization, duties as to increasing the stock of parents, etc., of such a station in Hawaii. The subject of supposed causes of deterioration of new cane seedlings is briefly touched and additional possible causes are mentioned.—*Nellie E. Fealy.*

1355. BARKER, H. D., AND H. K. HAYES. **Rust resistance in timothy.** Phytopathology 14: 363-371. 1 fig. 1924.—Experiments were undertaken to determine whether timothy rust, *Puccinia graminis phleipratensis* (E & H) Stak. & Piem., has several parasitic strains and also the mode of inheritance of resistance. Seedlings derived from selection of previous genetic experiments were used. Data on yield, growth, habit, etc., were taken for 3 years. A rust epidemic was produced by spraying with uredinospores. Plants of varying degree of resistance were selected and increased. Clonal lines were used in the experiments to determine whether there are biologic forms of timothy rust. Inoculations with rust collected in various parts of U. S. A. and Canada showed that timothy rust is not biologically specialized. This rust cannot produce aecia on barberry, which may be of significance in the origin of biologic forms. The self-fertilized clonal line and the crosses between clonal lines inoculated with rust showed that resistance or susceptibility is due to a single pair of genetic factors and that resistance is dominant.—*Adeline Ames.*

1356. BARROWS, W. MORTON. **Problems for a course in the general principles of heredity.** 27 p. Published by the author: Columbus, Ohio. 1924.—This work is a laboratory, loose-leaf guide and outline for a college elementary course in genetics. The outline is organized into 18 problems illustrating various phases of heredity, with both zoological and botanical materials.—*Orland E. White.*

1357. BARTLETT, H. **Wheat varieties and seed selection.** Agric. Gaz. New South Wales 35: 613-617. 1924.—It is recommended that continuous mass selection be practiced in wheats in order to maintain high vitality and yield and prevent deterioration.—*L. R. Waldron.*

1358. BELLING, J., AND A. F. BLAKESLEE. **The configurations and sizes of the chromosomes in the trivalents of 25-chromosome Daturas.** Proc. Nation. Acad. Sci. [U. S. A.] 10: 116-120. 2 fig. 1924.—Primary 25-chromosome plants are those which occur regularly in the offspring of a triploid pollinated from a diploid. Eleven of these are common. These primaries also come from diploids, probably through non-disjunction. Observed cases of non-disjunction, at the 1st division alone, would produce about 0.4% of 13-chromosome pollen-grains. From 10 of these primaries, 109 trivalents were isolated, of which 98 were in the form of an open V, a ring-and-rod, or a Y. A closed V-ring was not found. When, at the 1st metaphase, the 3rd chromosome was separate from the other 2 of the set, it was straight or nearly straight. Secondary 25-chromosome plants do not commonly come from triploids, and rarely come from primaries. Six of the secondaries gave 51 cases (out of nearly 100 trivalents) of the closed V-ring. When the 3rd chromosome of the secondary was separate at the 1st metaphase, it took the form of a small ring. Measurements made on the chromosome in 12 trivalents from each of 2 primaries and their corresponding secondaries showed that the chromosomes of the secondaries were of the same sizes as those of the corresponding primaries.

It is probable that homologous ends of the chromosomes are apposed in the trivalents. A hypothesis to be used for future work is that 1 chromosome of the secondary is made of 2 homologous segments of a normal chromosome; that is, if the homologous ends of the normal chromosomes in any set are designated *a* and *z* respectively, the normal chromosome being *az*, then the secondary has the chromosomes *az*, *az*, and *aa*, or the chromosomes *az*, *az*, and *zz*.—*J. Belling*.

1359. BLARINGHEM, L. *Mutations et chromosomes*. [Mutations and chromosomes.] Ann. Sci. Nat. Bot. 10<sup>e</sup> sér. 5: i-xxviii. 1923.—This is a sequel to an article, "Mutants et hybrides," in Vol. 3 of the same periodical. (See Bot. Absts. 11, Entry 3812.) A résumé of the literature on the subject is given, especially as applied to *Oenothera*; and the importance of the possible effect of environment upon mutable forms is emphasized.—*Paul Weatherwax*.

1360. BLARINGHEM, L. *Note sur l'origine du maïs. Métamorphose de l'Euchlaena en Zea, obtenu au Brésil par Bento de Toledo*. [Origin of maize from *Euchlaena*.] Ann. Sci. Nat. Bot. 10<sup>e</sup> sér. 6: 245-263. Fig. 1-6. 1924.—This article is based upon communications, photographs and specimens received from Brazil. *Euchlaena* is reported to have been changed into *Zea* (teosinte into maize) by 5 years of selection. Original type, resulting form, and intermediate steps are figured. These results are compared with Blaringhem's earlier work in producing hereditary changes in maize by mutilation.—*Paul Weatherwax*.

1361. BROŽEK, ARTUR. *Jednoduchý případ mendelovského dědění v kresbě květů dvou rač Mimulus quinquevulnerus Hort.* [Report on a simple Mendelian case of heredity of the flower stains in two races of *Mimulus quinquevulnerus* Hort.] (English summary) Biologické Listy 8: 18-33. 1 pl. 1921.—A variety of *Mimulus quinquevulnerus* called *rubinus* is characterized by having the distal  $\frac{1}{2}$  of the petals colored red; in another variety named *speciosus* the red color is limited to a spot of varying size. Complete genetic analysis involving  $F_1$ ,  $F_2$  and backcrosses shows that *rubinus* acts as a simple Mendelian dominant to *speciosus*.—*M. Demerec*.

1362. BRUNSWIK, H. *Neuere Untersuchungen über die Sexualitätsverhältnisse bei den Pilzen*. [Recent investigations on sex relations in fungi.] Zeitschr. Indukt. Abstamm. -u. Vererb. 34: 214-228. 1924.—This is a review of the papers published during the years 1919 to 1923 on the genetics of sexuality in fungi. The material is presented under 3 headings: *Mucorales*, *Ustilaginales*, and *Basidiomycetes*.—*M. Demerec*.

1363. BURD, L. H. *A preliminary note on a sterile dwarf rogue in Sea Island cotton*. Empire Cotton Growing Rev. 1: 46-48. 1924.—The plant "was very much reduced in height and the size of the parts, but otherwise differed little from the normal Sea Island type. . . . Normal dehiscence of the anthers did not seem to occur, and a brief examination showed that the pollen was abnormal." No seed were obtained from selfed flowers and only 1 boll, containing a single seed, resulted from open-pollinated flowers. When artificially pollinated with pollen of normal plants of the stock producing the rogue, 3 out of 20 flowers developed bolls containing 1 seed each. "Preliminary examination of the pollen formation. . . . strongly indicates a disturbance of the chromosome mechanism in the heterotypic and homotypic divisions. As the figures show, the tetrad formation is highly abnormal, any number up to 7 cells being visible instead of the usual 4." The author inclines to the view that the rogue originated by mutational loss, although the possibility is considered of its origin from a cross between Sea Island and a Serido cotton from Brazil.—*T. H. Kearney*.

1364. CARBONNIÈRES, C. DE. *La première génération hybride du maïs*. [A first generation hybrid of maize.] Rev. Bot. Appl. et Agric. Coloniale 4: 511-521. 1924.—This is a review of the literature on the value of  $F_1$  maize hybrids, being a reprint of an article which appeared in the Bull. Mens. Comice Agric. Castres, Feb.-April, 1924. The author recommends using the increase in the size of seed obtained in the  $F_2$  (xenia) generation as an index of the increase to be expected in the  $F_1$ .—*J. H. Kempton*.

1365. CASTLE, W. E. *Are the various parts of the body genetically independent in size?* Proc. Nation. Acad. Sci. [U. S. A.] 10: 181-182. 1924.—This is a reply to a criticism by F. B. SUMNER. (Proc. Nat. Acad. Sci. 10: 178-180.) The point at issue concerns the extent to which differences in total size among races of animals are due to factors which act on all parts of the body alike or on factors which act independently on the different parts of the body.



Castle emphasizes the former class, Sumner the latter. Castle's data were from crosses between 2 breeds of rabbit, Polish and Flemish Giant, at opposite extremes in size. He showed that the correlations between different bone measurements were very high in genetically heterogeneous groups. Sumner finds from Castle's data that the correlations within the original pure races were relatively low. Castle replies that these races were so close to pure lines that correlations on measurements within them can give information only on environmental, not on genetic variation.—*Sewall Wright*.

1366. CASTLE, W. E. **Linkage of Dutch, English and angora in rabbits.** Proc. Nation. Acad. Sci. [U. S. A.] 10: 107-108. 1924.—Crosses between self angora rabbits and Dutch short-haired rabbits produced shorthaired, low grade (heterozygous) Dutch in  $F_1$ . In  $F_2$  there were about the expected 25% angora and also about 25% high grade Dutch but none of the double recessives, Dutch angora, a result which indicated linkage. Two double recessive males were later produced from high grade Dutch found to be heterozygous for angora. These crossed with  $F_1$  females produced 7 crossovers in 68. This result is in harmony with the author's earlier discoveries that angora shows about 12%-14% crossovers with the English pattern which in turn shows complete linkage (or allelomorphism) with the Dutch pattern.—*Sewall Wright*.

1367. CASTLE, W. E. **The Japanese rabbit and gametic purity.** Proc. Nation. Acad. Sci. [U. S. A.] 10: 222-224. 1924.—The peculiar somatic effects of the combination of 2 sets of color factors of the rabbit are described, with special reference to a newly discovered 4th allelomorph of 1 set, the factor responsible for the Japanese pattern. Factor  $e$  reduces black ( $E$  or  $E^d$ ) to sooty yellow. The Japanese factor,  $e^j$ , gives a mosaic of the 2 colors. The addition of the agouti factor  $A$ , of an independent set of allelomorphs, changes the sooty yellow (of  $e$  and  $e^j$ ) to clear yellow with white belly, changes the black of  $E$  to the white bellied gray of wild rabbits, but it is without effect on the black of  $E^d$  or the black parts of  $e^j$ . Factor  $e^j$  thus behaves like a mosaic of its allelomorphs,  $E^d$  and  $E$ . The author suggests that it arose as a mosaic by imperfect segregation of  $E^d$  and  $e$  in a heterozygote.—*Sewall Wright*.

1368. CHAMBERLIN, JOSEPH CONRAD. **Concerning the hollow curve of distribution.** Amer. Nat. 58: 350-374. 1924.—This is a discussion of Willis' age and area hypothesis. The author presents data on the relation between the frequency of genera, classified by the number of species which they contain, and this number, as compiled from the work of various systematists from the time of Linnaeus for various groups of animals. He concludes that the "hollow (hyperbolic) curve of distribution," which represents the inverse relation between size and frequency, to which the hypothesis leads, is a real thing in nature, being revealed more clearly in good than in poor systematic work, though nearly always present to some extent. He is however inclined to doubt the advisability of a conscious use of the principle by systematists.—*Sewall Wright*.

1369. CHILD, C. M. **The problem of pattern in organisms. II. The physiological gradients.** Amer. Nat. 58: 322-336. 1924.—This is an outline of the author's views on the origin of pattern in organisms. He concludes that the pattern of development is determined primarily by the differential action of external factors. The hereditary constitution determines pattern only by conditioning the mode of reaction to external factors.—*Sewall Wright*.

1370. CLAUSEN, R. E., AND T. H. GOODSPEED. **Inheritance in *Nicotiana Tabacum*. IV. The trisomic character, "enlarged."** Genetics 9: 181-197. 1924.—The trisomic character enlarged in *Nicotiana Tabacum* exhibits an increase of about 8 mm. in tube length and 4 mm. in spread of flower as contrasted with normal. Inheritance of the character is similar to that of trisomics in *Datura*. Self-fertilization of "enlarged" gave about 41% "enlarged" and 59% normal plants, and occasionally plants bearing extremely large flowers, "superenlarged," which are believed to be tetrasomic. Enlarged ♀ × normal ♂ gave 35.5% enlarged and 64.5% normal; the reciprocal gave 3.4% enlarged and 96.6% normal. On the basis of meager data, "superenlarged" selfed gave 20% superenlarged, 77% enlarged, and 3% normal. Superenlarged ♀ × normal ♂ gave 94% enlarged and 6% normal; the reciprocal, 52% enlarged and 48% normal. The authors suggest that these results with superenlarged indicate that the simple establishment of a tetrasomic condition does not necessarily give rise to permanent increase in chromosome number.—*R. E. Clausen*.

1371. COHEN STUART, C. P. **Vragen betreffende selectie van meerjarige gewassen.** [Problems in the selection of perennial plants.] Mededeel. Proefsta. Thee Nederland.-Indië. Bijlage B. 82: 46-53. 1923.—If seed can easily be secured in quantity by self-fertilizing, this is the best method. If not, use mother trees which have been freely cross-fertilized. Even if selfing proves practicable, the uncertainty of vegetative development of the progeny makes it advisable to simultaneously carry on cross-fertilized mother-tree selection. If no very outstanding individuals are found, employ mass selection. The objections to mass selection are less valid for perennial crops than for annual. Mass selection now in progress in tea is expected to result in doubling the present yield. Improvement by selection in the quality of product is not so promising. Selection for disease or insect resistance demands for success that there shall be heavy infection or infestation.—*Carl Hartley.*

1372. COLLINS, G. N. **Measurement of linkage values.** Jour. Agric. Res. 27: 881-891. 1924.—The author compares 3 methods proposed for measuring linkage in  $F_2$  data. Use of Yule's coefficient of Association (Q), Emerson's method (P) and Haldane's method (T). All give correct results with a perfect population, but are variously affected by factors which disturb Mendelian ratios. These are classified in 3 groups: different effective frequency of gametes, differential viability of zygotes, and mistakes in classification. No one method is found to be most accurate for all classes but "Yule's coefficient, Q, most nearly meets the requirement of a general method, and a formula is given for evaluating the degree of linkage from observed values of Q."—*Sewall Wright.*

1373. COLLINS, H. H. **Studies of the pelage phases and of the color variations in mice of the genus Peromyscus.** Jour. Exp. Zool. 38: 45-107. 7 pl. (2 col.), 9 fig. 1923.—Full accounts are given of the points of origin and direction of growth, the structure and color of the different types of hair found in the juvenal pelage, the post-juvenal pelage, which usually begins at about 4 weeks, and the adult pelage, which appears at about 3 months. Different subspecies show characteristic differences in molting. The removal of the juvenal coat stimulates the growth of the post-juvenal coat. Within the subspecies *gambeli* the color varies from buff to dark. Experimental evidence is given to show that this variation is not due to fading or abrasions, nor to seasonal variations or age. Since the light and dark individuals are found in the same locality side by side and since they may be bred in the laboratory for several generations without losing their characteristic intensities, it is concluded that these are genetic differences. Crosses between the extremes give intermediate  $F_1$  and  $F_2$  generations. This may be considered a case of "blended inheritance," or equally well a case of multiple factors.—*E. C. MacDowell.*

1374. CONNER, A. B. **The interpretation of correlation data.** Texas Agric. Exp. Sta. Bull. 310. 5-24. 1923.—The author emphasizes the importance of distinguishing gametic and somatic factors as causes of correlation in biologic populations. Pure lines furnish data for discovering the purely somatic correlations which can then be used in interpreting the correlations in mixed populations. Four pure lines of Kafir showed an average correlation of -0.25 between height of plant and weight of green forage, indicating a negative somatic correlation, while a mixed population from 80 heads showed a positive correlation (+0.38) to be interpreted as genetic. Other illustrations from Kafir are given.—*Sewall Wright.*

1375. CROW, W. B. **Variation and hybridization in Isokontae and Akontae in relation to classification.** Jour. Genetics 14: 115-128. 1924.—In connection with several cases of hybridization reported by previous authors, it is pointed out that the differences between species and other subdivisions of the Isokontae and Akontae are sometimes compatible with an explanation of the origin of new forms by hybridization and subsequent Mendelian segregation. In other cases, distinctions between species or between genera are of similar nature to those appearing between individuals of a single species in consequence of environmental differences. It is suggested that characters originally developed as responses to environmental conditions have in some instances become fixed in inheritance and therefore of taxonomic importance. Few of the variations of either of the types here discussed throw any light upon the possible origin of the differences which distinguish classes.—*C. E. Allen.*

1376. CUNNINGHAM, J. T., AND CEDRIC DOVER. **Mendelism and evolution.** Nature 114: 9-10. 1924.—Two comments are given upon an article by Huxley in the number for June 7th.—*O. A. Stevens.*



1377. DANFORTH, C. H. **The heredity of unilateral variations in man.** *Genetics* 9: 199-211. 1924.—A review of about 20,000 pairs of structures indicates that anatomical variations in man tend to be bilateral. Some of these are demonstrably hereditary. A phenomenon which may be designated as "non-appearance" is recognized. The appearance or non-appearance of a trait, potentially present, may be influenced by the sides of the body, by the sex, and probably by the race of the individual.—*Author*.

1378. DANFORTH, C. H. **The problem of incidence in color blindness.** *Amer. Nat.* 58: 447-456. 1924.—Assuming that color blindness is a simple sex-linked trait the incidence of color blind women is  $2\frac{1}{2}$  times too high. Several possible explanations of this fact need testing. The most probable hypothesis at present would seem to be that the elevation of the female rate is due to inbreeding within geographically or socially limited groups.—*C. H. Danforth*.

1379. DAVENPORT, C. B. **Body-build and its inheritance.** *Carnegie Inst. Washington Publ.* 329. vi + 176 p., 9 pl., 53 fig. 1924.—This is a study of variation in slenderness and fleshiness among people, and of the hereditary factors upon which these characteristics depend. Two types of variation are distinguished, the ontogenetic and the adult. The ratio of chest-girth to stature is regarded as the best index of build; and, where chest-girth is unknown, for adults, the ratio of weight to the square of the stature. Racial, geographical, and ontogenetic differences in build are discussed. The mass polygon of distribution of build shows 2 modes at all ages, evidence of at least 2 biotypes of build. Slenderness is associated with tendency toward tuberculosis, pneumonia, nervousness, melancholia. Slender parents have smaller families than fleshy ones, and their children show less regression toward mediocrity than those of fleshy parents. There appear to be recessive genes for slenderness carried by the fleshy. There is a marked tendency for persons of similar build to intermarry. Some slender parents carry 1, others 2 zygotic factors for build. Some parents of medium build are heterozygotes; others belong to a medium-build biotype. The  $F_1$  generation derived from a slender  $\times$  fleshy mating is quite variable, as is commonly found where multiple factors are concerned. Its mode is fleshy, indicating partial dominance of that condition. The  $F_2$  generation is still more variable than the  $F_1$ .—It appears that variations in build are not to be accounted for merely by variations in the relation of the intake to the outgo of calories, but also by endogenous factors that determine "economy of nutrition." Hereditary factors are involved in producing such differences and probably work through the intermediacy of special organs that influence metabolism, notably the endocrine glands.—*Author*.

1380. DAVENPORT, C. B., H. L. TAYLOR, AND L. A. NELSON. **Radio-ulnar synostosis.** *Arch. Surg.* 8: 705-762. 1924.—Radio-ulnar synostosis is a condition in which the 2 bones of the forearm are united proximally for a distance of 2-6 cm. The radius is the bone chiefly affected. In the mildest cases it is only slightly modified; in the more marked cases its upper end is greatly reduced and carried forward over the ulna. Aside from this range in the manifestation of the trait, certain exostoses are frequently associated with it. It may be unilateral. The condition is rare, only about 100 cases having been reported—over a 3rd of them in the present paper. Males are twice as likely to be affected as females, but the trait is not sex linked in the usual sense. The distribution of affected individuals in 1 family could be explained on the assumption of a single causative gene in the Y chromosome, but the other family histories indicate the presence of 2 or even 3 dominant autosomal genes. In many of the mammals a firm union of the radius and ulna is an advantage and in some of these the synostosis, perhaps 1st arising in the same manner as in man, has become characteristic of whole species and even genera and families.—*C. H. Danforth*.

1381. DENDY, ARTHUR. **Outlines of evolutionary biology.** 3d ed. xliii + 481 p. Constable & Co.: London, 1923.—In this edition the subject matter has been amplified by the inclusion of results of recent research. The chapters on heredity have been amplified chiefly by a discussion of the theory of linkage and the localization of the genes in the chromosomes as set forth by T. H. Morgan. The portion dealing with the presence and absence hypothesis is retained as in the 2d edition. The problems of the origin of living things, the individuality of the organism, and the age of the earth have received more attention. A summarizing chapter has been added which treats concisely of the mechanism of organic evolution and of the ancestry of man.—*J. L. Collins*.

1382. DRY, F. W. Sex ratio data for two chalcid egg parasites of the coffee bug. Jour. Genetics 14: 219-224. 1924.—McColloch and Yuasa found that unmated females of the chinch bug egg parasite (*Eumecrosoma benefica* Gahan) produced only males. Females from the field and females mated in the laboratory produced less than 30% males. The author finds conditions similar for *Hadronotus antestiae* and *Telenomus truncativentris*, parasites of the coffee bug (*Antestia lineaticollis*, Stal.).—P. W. Whiting.

1383. DUERDEN, J. E. Methods of evolution. Sci. Prog. 18: 556-564. 1924.—The author discusses from the standpoint of evolution, the results contained in several of his published papers on the callosities and feathers of the ostrich and on the association of degeneration of the limbs with elongation of the body in reptiles.—H. C. McPhee.

1384. ENOMOTO, NAKAE, AND YOITI KAKIZAKI. Bud-variation in the peach and the sand pear. (Japanese.) Idengaku Zasshi [Japan. Jour. Genetics] 1: 107-116. 5 fig. 1922.—The authors observed 8 cases of bud variation in fruit trees, 1 in a race of peach called "Rikaku Suimitu," others in the sand pear, of which 2 belong to the race "Tyôzyûrô" and 5 to "Waseaka."—In the case of the peach, the sported branch distinguishes itself from the other part of the plant in the ripening season of the fruit which became ripe 10-14 days earlier than usual. The new character is transmitted to the plants propagated by grafting, without any change. It was confirmed by biometrical study, however, that there are hardly any differences observable between the sport and the original type in any other characters of leaves, flowers, fruits, etc.—In 1 case of the sand pear, "Tyûzyûrô," the biometrical study of the sported branch has shown some increase in the size of leaflets, petals, pistils, filaments, pollen grains, fruits, etc. The commercial qualities of the fruit of the sported type, as flavor, taste, texture and keeping quality are of higher grade. All of those properties are transmissible through the vegetative propagation by means of grafting. Another sport in the same variety is a variation in the fruit color which is yellow instead of reddish brown as in the original type.—In the sand pear, "Waseaka," all 5 cases of bud variation observed are of the same nature, and yield fruit which differ from the original type in size, form, color, and maturity.—Author. (Courtesy Japanese Jour. Bot.)

1385. EYSTER, W. H. A genetic analysis of variegation. Genetics 9: 372-404. 1 pl., 7 fig. 1924.—This is a study of the inheritance of variegated pericarp of the seed of maize based on the progeny of a single ear having dilute red or orange pericarp. Orange pericarp was found to be inconstant, giving rise to colors ranging from whitish to deep cherry red as well as to a number of distinct variegations. The orange color separates into its component colors, red and white, forming a variegation. These variegations seem to occur more frequently in the orange pericarp of medium intensity than in the extremely light or extremely dark classes. The variegations are inconstant, varying in pattern from fine to coarse. There is a correlation between the intensity of the orange color and the type of variegation which originates from it. The percentage of heavy variegation increases with the color intensity. All color and pattern changes are reversible but with different frequencies. This behavior has led the author to the conclusion that the gene for orange pericarp is a compound structure composed of pigment and non-pigment-producing gene elements. On this view variegations are produced when the contrasted gene elements become completely segregated in the somatic tissues.—J. H. Kempton.

1386. EYSTER, W. H. A second factor for primitive sporophyte in maize. Amer. Nat. 58: 436-439. 1924.—This paper notes the existence of a 2nd factor for primitive sporophyte in maize. The new factor is independent of the 1st factor discovered and behaves as a complement to it, resulting in 9:7 ratios when a plant heterozygous for both factors is self-pollinated. The new factor has been given the designation  $pm_2$ , the original factor being labeled  $pm_1$ .—J. H. Kempton.

1387. FICK, A. Die Familie Wislicenus. [The Wisliczky family.] Arch. Rass. -u. Gesellschaftbiol. 15: 156-172. 1 pl. 1923.—In 1646 Parson Johannes Wisliczky left Poland for Hungary on account of persecution. From him 6 generations later, descended Gustav A. Wislicenus, born 1806, a preacher, who settled 1st in Germany and then in Switzerland. He had a son, Johannes (b. 1835), who became the most famous professor of chemistry in Germany. He married the daughter of a chemist. She became insane and so did 2 of her



children while 2, Wilhelm and Hans, became professors of chemistry. Another grandson of Gustav A. Wislicenus is Roland Scholl (b. 1865) professor of chemistry at Dresden. A nephew of Gustav A. is the astronomer, Walter Wislicenus.—*C. B. Davenport*.

1388. FISCHER, E. Schädelform und Vererbung. [Head form and heredity.] Zeitschr. Indukt. Abstamm. -u. Vererb. 33: 347. 1924.—When young rats are deprived of vitamin A their skulls not only remain smaller but actually become more brachycephalic. The experimental rats showed cephalic indices of 38.8–46.7, the controls indices of from 34.9–38.0.—*C. H. Danforth*.

1389. FOREMAN, E. C. Inheritance of higher fecundity and the mode of transmission. Michigan Agric. Exp. Sta. Rept. 1922: 231–232. 1922.—The following deductions are made on the inheritance of fecundity in poultry: (1) That higher fecundity does not behave in Mendelian fashion because it is neither dominant nor recessive, (2) that high fecundity may be transmitted equally by sire and dam, (3) that early maturity is correlated with high fecundity and is usually influenced more by sire than by dam. Extreme precociousness is not considered a safe criterion of individual laying ability, and (4) that egg production is associated with individual vigor and does not appear to be a unit character.—*F. A. Hays*.

1390. FREDERIKSEN, ERHARD. Om Forædling af Landbrugets Kulturplanter, specielt med Henblik paa Anvendelsen af den diallele Krydningsmetode. [Agricultural improvement, particularly by cross breeding methods.] Tidsskr. Landokonomi 7: 357–403. 1924.—A rather complete discussion is given of the improvement and creation of agricultural varieties by plant breeding.—*Albert A. Hansen*.

1391. GABRITSCHESKY, E. Farbenpolymorphismus und Vererbung mimetischer Varietäten der Fliege *Volucella bombylans* und anderer "hummeähnlicher" Zweiflüger. [Color-polymorphism and heredity of mimetic varieties of the fly, *Volucella bombylans*, and other bumble-bee-like Diptera.] Zeitschr. Indukt. Abstamm. -u. Vererb. 32: 321–353. 4 fig. 1924.—Several varieties of this Syrphid living in the nests of bumble-bees strikingly resemble their various hosts. These have not yet crossed in captivity; fertile eggs are obtained by smearing honey on a cork, on the under side of which the female will lay. Mating occurs in flight, after July 15. The pairs settle to the ground. Entrance to the nest is facilitated by the coloration and by bee-like behavior upon irritation. The larvae feed on wax, pollen, and later, bee larvae.—Three varieties, hitherto described as distinct species, differ in hair color and resemble various species of *Bombus*: (1) *V. bombylans*, black, except tip of abdomen, which is red-brown or rusty-yellow; (2) *V. haemorrhoidalis*, yellow, replacing black of thorax and of abdomen in front of 3rd segment, which is black as in all varieties; tip of abdomen red brown; (3) *V. plumata*, yellow, but tip of abdomen white.—*V. bombylans* ♀ × (1) ♂ produced either all (1) or (1) + (2) in a 3:1 ratio, or (1) + (3) in a 3:1 ratio, *V. haemorrhoidalis* ♀ × homozygous (1) ♂ produced all (1), *haemorrhoidalis* ♀ × heterozygous (1) ♂ produced both (1) & (2) in a 1:1 ratio. Three broods gave a total of 25 (1):26 (2); 2 others, 48 (1): 10 (2), the (2) were all females. One brood of 5 ♀, 11 ♂, all (2), is recorded from (2) ♀ × (1) ♂. [Apparently the ♂ was (2)]. *V. plumata* ♀ × (3) ♂ produced all (3). *V. plumata* ♀ × (1) ♂ produced (3) + (1) in a 1:1 ratio. *V. plumata* ♀ × (2) ♂ produced (3) + (2) in a 1:1 ratio. If *B* represents black, or *bombylans*, *b*, yellow (*vice H*, of author), *R* red brown, *r* white of tip of abdomen (*vice P*), then *V. bombylans* is *BBRR*, and *BbRR* or *BbRr* is New var. "*flava*," red brown hairs on thorax; *V. haemorrhoidalis* is *bbRR* or *bbRr*, "*var. a*," tip of abdomen yellow, not red brown as in *flava*; *V. plumata* is *bbrr*.—The inheritance is apparently neither sex-linked nor sex-limited. The hairs of the middle of the thorax are black in the ♂, yellow or red in the ♀ in the heterozygous var. *flava*, in *haemorrhoidalis*, and in *plumata*. In all varieties, the ♀ has the larger antennae and the cuticula of the 3rd abdominal segment is blacker. Three varieties probably may be obtained in 1 brood. Twenty-one theoretical combinations are worked out to *F*<sub>1</sub> and *F*<sub>2</sub>. In the Caucasus, white replaces black of *bombylans* on thorax and front of abdomen; similarly, in that locality white replaces black in *Bombus niveatus* and *B. caucasicus*, the color of tip of abdomen (red or yellow) remaining the same. Lists of *Bombus*-like flies and their *Bombus* models include (1) monomorphic, (2) polymorphic, for example, *V. bombylans*, (3) sexually dimorphic, species. [In the last, the ♂ mimics one, the ♀ another species of *Bombus*. The ♀ of *Leucozona* mimics a white-tailed *Volucella*,

and both frequent wasp colonies.] (4) Flies with dimorphic *males*, both mimicking different species of *Bombus*. The haphazard distribution of hair color among different regions of the body makes any physiological explanation difficult, but the occurrence of similar color series in different genera and even families suggests that analogous cytochemical processes occur in them all.—Mimicry is a specialty of insects explicable by their germinal constitution and its mechanism of inheritance. After discussing protective color changes in pupae due to light of various wave lengths, the author concludes that protective resemblance may be the result of environmental factors acting at pupation and not hereditarily fixed, whereas protective mimicry is based on a restricted number of genetic factors in "models" and "mimics," independent of external influences, not subject to chance and abrupt variation, frequently repeated and recombined in accordance with the laws of heredity.—*J. H. Gerould*.

1392. GATENBY, J. B., AND F. W. R. BRAMBELL. Notes on the genitalia of a crowing hen. Jour. Genetics 14: 173-183. 1924.—A White Leghorn fowl is described that possessed the external characters of a normal hen until 2 years of age. Shortly after 2 years old the bird began to crow and developed a male comb and wattles. It was also observed to crow frequently but did not tread. Post-mortem showed very large masses of fat covering the viscera. The oviduct was small but normal. A flat gonad was found on the left side. Sections of which showed it to be an ovary full of scar tissue. Numerous tubules of testicular nature almost filled the gonad. In front and outside of the above gonad many areas of newly formed tissue were found. This new tissue was possibly testicular although normal spermatid tubes and spermatogonia were not present. This new tissue arose by transition of peritoneal epithelial cells into germ cells.—*F. A. Hays*.

1393. GEISER, S. W. Sex-ratios and spermatogenesis in the top-minnow, *Gambusia holbrooki* Grd. Biol. Bull. 47: 175-213. 1924.—A review of the literature on sex-ratios in fishes in general and in Poeciliids in particular is presented, showing that a great excess of females has often been observed in collections, especially in *Gambusia*. The author made a detailed study of the sex organs and of spermatogenesis in *Gambusia holbrooki*, and presents descriptions, figures and plates relating thereto. No special features of spermatogenesis were observed which might account for atypical sex-ratios. Several litters of *Gambusia* were then reared under controlled conditions in aquaria, and these exhibited approximate equality of the sexes. Further evidence is presented that males are less viable than females, consequently atypical sex-ratios are assumed to depend upon differential mortality.—*R. E. Clausen*.

1394. GOLDSCHMIDT, R. Untersuchungen über Intersexualität II. [Investigations on intersexuality.] Zeitschr. Indukt. Abstamm.-u. Vererb. 29: 145-185. 1 pl., 19 fig. 1922.—A ♀ intersex begins development as a ♀. Reaching sooner or later a turning point, it develops as a ♂; the earlier the turning point, the more pronounced the maleness. Female intersexes of the "chief type" are females showing ♂ coloration blended with ♀; "mosaics" are streaked and spotted with ♂ characters. Male intersexes (males transformed into females) are mosaics only.—Normal antennae of both sexes develop on the ventral side of the pupa as flat plates, each like a lanceolate leaf with bent axis, triangular in cross-section, that is, a longitudinal ridge, projecting toward the inside of the pupa, runs the length of the leaf nearer its inner margin (median-ventral side), making the plate a tapering prism. From this ridge 1 row of barbs grows obliquely inward; the other row develops earlier in the flat superficial plane of the plate. In a normal ♀ antenna, the plate (beneath its chitinous covering) shrinks along both margins into a narrow shaft, with 1 row of stumpy barbs growing out of it parallel to the surface of the plate, 1 obliquely inward. When a ♀ intersex reaches the turning point, this shrinkage stops, and new growth occurs along ♂ lines. In a ♂ intersex, up to high intersexuality, normal growth of the outer row of barbs occurs, but the inner one atrophies. The outer row, when the turning point comes, has already reached its "determination-point" (Spemann) and does not degenerate; the inner row still, undetermined (plastic), is held back in its development.—Transition stages in structure of tip of abdomen in ♀ intersexes are described. The frenulum (bundle of fine bristles in the ♀, single bristle in the ♂) agrees in grade of intersexuality in "chief type" intersexes with wing-size and shape (that is, conservatively ♀), whereas wing-color becomes ♂-like. In mosaic intersexes the frenulum agrees in grade of intersexuality with color of the surrounding spot, just as the form of scales on any spot agrees



with the color ( $\sigma$  or  $\varphi$ ) of the spot. Color of palps and legs, however, agrees in grade of intersexuality with antennae, etc. not with wing-color. Female intersexes of the beginning type are fertile. Occasionally 1 of the next higher grade lays a few fertile eggs. High grade  $\varphi$  intersexes with  $\sigma$  coloration are distinguished from males only by the pupa case, external genitalia, and ovario-testis.—If wing color were to behave like every other character, it would react as a whole in sex-reversal. This is true only of the chief-type, not of the mosaic. In the development of colors of a  $\sigma$  (mosaic) intersex, white ( $\varphi$ ) scales reach full development, while dark ( $\sigma$ ) scales are still immature. "Determination-streams" proceed from the base of the wing very irregularly over the whole, causing differentiation of spot after spot, 1st as  $\sigma$ , then as  $\varphi$ , or *vice versa*. The turning point comes extremely early (wing bud of larva) in highly intersexual males, and the  $\sigma$  "determination-stream" affects a large part of the wing area. Nevertheless, differentiation of scales and development of pigment do not occur in these ( $\sigma$ ) parts as early as in the small areas later to be affected by the  $\varphi$  "stream," since white scales on the latter are developed before the dark scales upon the  $\sigma$  spots. The difference between mosaic and "chief type" intersexes is apparently due to the earlier turning point of the former. Scales of  $\varphi$ -determined shape are capable of developing dark  $\sigma$  pigment, as seen in the "chief type," but the dark pigment of  $\sigma$ -determined scales cannot be suppressed. Various characteristics differ widely in degree of intersexual transformation; this depends on racial differences in velocity of development of different organs.—Temperature experiments are described. Exposure of pupae to  $+1^{\circ}\text{C}$ . for 4-6 weeks had no noteworthy effect upon intersexuality. Antennae of treated females showed no lengthening of barbs except in a few individuals in which a very slight inhibition of retrogressive development occurred. Broad plates (instead of feather-shaped) occurred in some females, and frequently a membrane replaced the feather in males. Results of exposure to  $+8-9^{\circ}\text{C}$ . were: (1) The longer the exposure the shorter the time after exposure ceases, before eclosion; (2) degeneration of ova in ovaries; (3) antennae of the  $\varphi$  after 4 weeks exposure became strongly feather-shaped and  $\sigma$  like, as found by Kosminsky; (4) decided darkening of the wings of the  $\varphi$ , though not so fully  $\sigma$ -like as in intersexes. It is not certain that these changes indicate a real change toward maleness because no changes in external genitalia occurred. Increase in degree of intersexuality by cold was shown only by a single  $\varphi$ . A mutation in the valency of factor *M*, that is, a multiple allelomorph of *M*, appeared in the "strong" race, Aomori. Normally a "weak" Kumomoto  $\varphi \times$  Aomori  $\sigma$  gives all females intersexual, but this combination in 1920 gave 54  $\sigma$   $\sigma$ , 29 normal  $\varphi$   $\varphi$ , 20 intersexual  $\varphi$   $\varphi$ . Other evidence shows that the heterozygous parent concerned was the  $\sigma$ , which was changed from a strong to a heterozygous strong-weak condition. Strong and weak stand at the ends of a series of multiple allelomorphs of *M*. This particular mutation is a jump from one end of the scale to the other, without intermediates.—*J. H. Gerould*.

1395. GOODACRE, W. A. The queen bee competition at Wauchope. Final results. *Agric. Gaz. New South Wales* 35: 679-681. 1924.—Notes are given on tests for gentleness, disease resistance, and stamina.—*L. R. Waldron*.

1396. GOODALE, H. D. Intertubular tissue in the testes of certain birds. *Amer. Nat.* 58: 92-93. 1924.—Examination of sections of testes from 3 species of warblers showed large lymphocytes forming a tissue in the intertubular spaces. Such cells were not found in the testes of brown thrashers, English sparrows, or ducks. There are a few in the testes of robins and bluebirds. These cells are not like luteal cells and are much larger than the lymphocytes found in chicken testes. Luteal cells were not found in the ovary of an adult robin, nor in the ovaries of young English sparrows and grosbeaks. In domestic ducks they are less conspicuous than in chickens.—*F. A. Hays*.

1397. GOODALE, H. D., AND J. F. NONIDIZ. Luteal cells and hen-feathering. *Amer. Nat.* 58: 91-92. 1924.—Examination of sections of testes from a series of normal and a series of hen-feathered males failed to establish any relation between the presence or absence of either luteal cells or lymphoid cells and the character of feathering.—*F. A. Hays*.

1398. GOODSPEED, T. H. Some chromosome numbers in *Nicotiana*. *Amer. Nat.* 58: 381-382. 1924.—The following chromosome counts are reported: 9 pairs in *N. Langsdorffii*, *N. alata*, and *N. longiflora* (the last 2 showed some 10's); 12 pairs in *N. sylvestris*, *N. glauca*,

*N. suaveolens* (doubtful), *N. glutinosa*, *N. paniculata*, and *N. acuminata*; 24 pairs in *N. Tabacum*, *N. rustica*, *N. Bigelovii*, and *N. nudicaulis*.—John Belling.

1399. GOWEN, J. W. The application of the science of genetics to the farmers' problems. *Sci. Agric.* 5: 1-12. 1 fig. 1924.—The field of practical breeding is reviewed, showing the great advances which have been made and their reliance upon scientific investigations. Attention is called to the possibilities as to future developments in applied genetics. Data are given showing the behavior of certain Guernsey sires in terms of daughter production corrected to age yields and to yields freed from genetic influence of dams placed in octile groups.—L. R. Waldron.

1400. GOWEN, JOHN W. The inheritance of milk yield and some of its practical applications. *Record of Proc. Amer. Soc. Animal Production. Ann. Meeting.* 1922: 102-104. 1922.—A brief summary of studies on the correlations between related Holstein-Friesian cows with respect to milk yield and butterfat production. The general conclusions are reached that these characteristics are strongly and equally transmitted by sire and dam but that correlations with ancestors more remote than the grandparents are of little practical importance.—Sewall Wright.

1401. GRAHAM, R. J. D., AND S. C. ROY. Linseed (*Linum usitatissimum*) hybrids. *Agric. Jour. India.* 19: 28-31. 1924.—In the Central Provinces and Berar, nearly 1 million acres are cropped annually to flax. Self-pollination has been observed to take place in less than 5% of cases. Inheritance studies of flower color and seed-coat color show that blue corolla is dominant over white and that brown seed is dominant over light brown with blue-flowered plants), with a single factor engaged in both cases. Blue corollas with light brown seed  $\times$  white corollas with yellow seed gave a 3:1 ratio with the parent characters recovered. Blue corollas and pale brown seed  $\times$  white corollas and dark brown seed gave a 9:3:3:1 ratio. Absence of white corollas and light brown seed in 1 individual is presumed to be due to an inhibiting factor carried in the white-flowered plants. White-seeded plants gave a higher oil content with a lessened yield per acre.—L. R. Waldron.

1402. GUYÉNOT, E., AND PICTET, A. Une apparente anomalie mendélienne chez le co-baye: récessifs donnant des dominants. [An apparent mendelian anomaly in guinea pigs: recessives giving dominants.] *Compt. Rend. Soc. Biol.* 89: 1086-1088. 1923.—Two bi-color guinea pigs (red and white, recessive) gave offspring showing agouti spots (dominant). Genetic analysis showed that 1 of the parents was a tri-color animal in which the white spots had happened to cover all the agouti areas.—E. C. MacDowell.

1403. HADLINGTON, JAMES. Poultry work in progress at Hawkesbury Agricultural College. *Agric. Gaz. New South Wales* 35: 673-676. 1924.—A brief synopsis of work for testing methods of transmission of high fecundity are outlined. The work has been conducted for 8 years. In crossing the 2 breeds, Leghorn and Game, characterized by high laying and low laying qualities, it was not found that fecundity is a sex-limited character, as indicated by Pearl's investigations. The reciprocal crosses of the 2 breeds gave essentially intermediate results.—L. R. Waldron.

1404. HAGIWARA, TOKIO. On the crossover and interference in the Japanese morning glory. *Bot. Mag. Tôkyô* 36: 55-60. *Illus.* 1922.—The author has found between the factors *v* (for variegation; *V* for whole color) and *d* (for rolled leaf; *D* for normal) the gametic ratio 6.4:1:1:6.4, and consequently the crossover 13.51%, between *h* (for heart-shaped leaf; *H* for normal) and *v* the ratio 1.4:1:1:1.4, and the crossover 41.67%. From this it follows necessarily that a linkage relation must exist also between *h* and *d*, which has been proved experimentally to be the case, the gametic ratio and the crossover being 1.3:1:1:1.3 and 43.48% respectively. It was concluded that all 3 factors lie on the same chromosome in the order *h*, *v* and *d*. By means of the back-crossing  $DdVvHh \times ddvvhh$  and its reciprocal the author has determined that the ratios of the single as well as the double crossovers, namely,  $Dvh + dVH = 4.8\%$ ,  $DVh + dvH = 35.5\%$ .  $DvH + dVh = 8.9\%$ , so that the total amount of the crossovers between *V* and *D*, and that between *V* and *H* are, respectively,  $4.8 + 8.9 = 13.7$  and  $35.5 + 8.9 = 44.4$ . The expected ratio of double crossover should be therefore  $13.7 \times 44.4 : 100 = 6.08\%$ , that is, it is 2.82% less than the real number. This difference is evidently due to the interference phenomenon of the crossover, the negative interference in the sense of Bridges, the coincidence being 1.46.—Author. (Courtesy Japanese Jour. Bot.)



1405. HAGIWARA, TOKIO. On the linkage in the morning glory. (Japanese.) Jour. Sci. Agric. Soc. 236: 373-392. 1 fig. 1922.—The occurrence of linkage was found between the factors  $k$  (for leaf-shape called, "Tonboba,"  $K$  for typical trilobed shape),  $c$  (white corolla-color;  $C$ , non-white),  $l$  (for intensifying corolla-color;  $L$ , for pale corolla-color),  $F$  (for "hukurin;"  $f$  for non-"hukurin"), and  $u$  (for "udu"-character;  $U$ , for non-"udu"). The following linkage relations were determined: Between  $c$  and  $k$  the gametic coupling 2:1 and the crossover 33.33%; between  $l$  and  $c$  the gametic repulsion 1:71 and the crossover 1.4%; between  $u$  and  $f$  the crossover 1% (in accordance with Imai; between  $u$  and  $l$  the coupling either 2:1 or 3:1. All 5 factors form 1 linkage group lying on the same chromosome in the order  $k, c, l, F$  and  $u$ . In some cases decrease of the linkage intensity proportional to increase of the heterozygosity was observed, as seen in the sweet-pea by Punnett. Thus the author has found in the cross  $CULF \times CULf$  the coupling 4:1; in  $CULF \times Culf$  3:1; and in  $Culf \times cULF$  2:1. The reason for this variability is not yet clear.—Author. (Courtesy Japanese Jour. Bot.)

1406. HAGIWARA, TOKIO. On the linked genes and the linkage group in the leaf of morning-glory. (Japanese.) Jour. Sci. Agric. Soc. 224: 337-377. 1 fig. 1921.—The author studied the inheritance mode of the following allelomorphs in the leaf of morning-glory: Variegated and green, rolling of margin and normal, leaf-shape called "Tonboba" (dragon-fly leaf, each leaf consisting of 2 parts somewhat resembling the expanded wings of a dragon-fly) and normal, round leaf-shape and normal, leaf-shape called "Rangikuba" (very irregularly and deeply lobed) and normal. Of each allelomorphic pair the 2nd is in all cases either perfectly or imperfectly dominant to the 1st, and in  $F_2$  the 3:1 segregation is exhibited. The following linkage ratios were found: 6.4:1 between variegation and rolling of leaf margin, 1.44:1 between round shape and variegation, 1.3:1 between round shape and rolling of margin. The author thinks that according to the chromosome hypothesis the genes for rolling of leaf margin, variegation and round shape form 1 linkage group lying on 1 and the same chromosome, and, based on the values of crossing-over, he has drawn a linear chromosome map where the gene for variegation is situated between the 2 others. Whether or not the gene for "Rangikuba" shape lies on this same chromosome is not yet decided.—S. Ikeno. (Courtesy Japanese Jour. Bot.)

1407. HAGIWARA, TOKIO. The inheritance of the tube-characters in morning glory. (Japanese.) Bot. Mag. Tôkyô 36: (63)-(79). 3 fig. 1922.—The flower-tubes of morning glory are either white or colored; in the latter case they are entirely or partially so, otherwise very slightly so only at the bottom. The following factor-hypothesis founded on experimental evidence will most suitably explain the tube-characters just mentioned, as well as some experimental results obtained by the author:  $C$ , the factor for the corolla-color (that is, other than white);  $c$ , that for white corolla-color;  $T_1$ , that for the total coloration (non-white) of the tube, which is active either in the presence or the absence of  $C$ ;  $t_1$ , that for the partial coloration (non-white) of the tube, active only in the presence of  $C$ ;  $T_2$ , that in the presence of which either  $T_1$  or  $t_1$  is enabled to develop fully its respective power; and  $t_2$ , that not having the above mentioned action.—Thus the totally colored tube is to be designated as  $C T_1 T_2$ , the partially colored one as  $C t_1 T_2$ , and the one slightly colored only at the bottom but otherwise entirely colorless as  $C T_1 t_2$ . The whole coloration is a simple Mendelian dominant to the partial and the slight, respectively. The fact that some flower-colors are almost always accompanied by certain flower-tube colors, as observed by Imai, may be due perhaps to a linkage of high intensity existing between  $b$ , the factor for the former character, and  $t_2$ , that for the latter, though he considers that the phenomenon may be due either to linkage or to multiple allelomorphism. The crossover of this linkage may be between 0.41% and 2.22%. Moreover, the occurrence of linkage having the crossover 20.0% was found between the factors  $t_1$  and  $t_2$ .—According to the chromosome hypothesis all factors under discussion should be arranged on 1 and the same chromosome in the order  $b, t_1, t_2$ .—Author. (Courtesy Japanese Jour. Bot.)

1408. HANSON, FRANK B., AND FLORENCE HAYS. Correlations of body weight, body length and tail length in normal and alcoholic albino rats. Genetics 9: 368-371. 1 fig. 1924.—Sixty coefficients for the correlations between body weight and length and tail length at different ages are given. These range from 0.70 to 0.97. No significant differences appear

between the correlations for males and females, or between those for the rats treated with alcohol and their controls.—*E. C. MacDowell*.

1409. HANSON, FRANK B., AND FAITH N. SHOLES. Seasonal differences in sex ratio, litter size and birth weight of the albino rat under uniform laboratory conditions. *Genetics* 9: 363-367. 1924.—When the averages for periods of 3 months are compared, 108 litters of rats born during a period of 2 years show no significant seasonal variations in sex ratio, litter size or birth weight.—*E. C. MacDowell*.

1410. HARRIS, REGINALD G. Control of the appearance of pupa-larvae in paedogenetic diptera. *Proc. Nation. Acad. Sci. [U. S. A.]* 9: 407-413. 1923.—The author gives the results of experiments undertaken to ascertain what factors control the appearance of the 2 types of larvae in *Miastor*—1 type reproducing by paedogenesis and incapable of metamorphosing into pupae, the other type giving rise to pupae but incapable of paedogenesis. It was found that light alone does not induce the appearance of pupa-larvae, as has been suggested by Springer. Temperature also is not an activating factor. Since pupa-larvae occur in old or crowded cultures, practically uninfluenced by light and temperature, it seems that their appearance is concurrent with or subsequent to the accumulation of biproducts of metamorphosis, and is caused by external factors.—*Grace Sandhouse*.

1411. HARRISON, J. W. HESLOP. The inheritance of wing color and pattern in the Lepidopterous genus *Tephrosia* (*Ectropis*) with an account of the origin of a new allelomorph. *Jour. Genetics* 13: 333-352. 1 pl. 1923.—Further investigations into the inheritance of melanism in the interspecific crosses between *Tephrosia crepuscularia* var. *delamerensis* ♀ and *T. bistortata* ♂ reveal, as previously, a failure in the 3:1 ratio in the F<sub>2</sub> generation of such hybrids. Unlike what occurred in the early cross, no great spread of variation was encountered in the F<sub>2</sub> insects. Instead of types and melanics, the F<sub>2</sub> brood included types, streaks (mosaics) and melanics. The character "streak," when tested by means of breeding experiments, proved to form, with melanism and type, a series of multiple allelomorphs with 3 members. Streak is dominant to type and recessive to melanism. This character originated through a degradation of the gene for melanism during interspecific crossing. Unit-characters are therefore not constant under all conditions. In the cross between *T. bistortata* ♀ and *T. crepuscularia* var. *delamerensis* ♂, and others in which this hybrid was concerned, in back crosses and other broods involving F<sub>1</sub> melanic (*T. crepuscularia* var. *delamerensis* ♀ × *T. bistortata* ♂) males, and in complex crosses in which the true melanics of the F<sub>2</sub> (*T. crepuscularia* var. *delamerensis* ♀ × *T. bistortata* ♂) participated, the inheritance of melanism was of the usual simple Mendelian type. Certain back crosses between (*T. crepuscularia* var. *delamerensis* ♀ × *T. bistortata* ♂) females and *bistortata* males gave rise to extremely aberrant ratios.—*Author*.

1412. HERZ, J. Die experimentelle Vererbungslehre, eine wissenschaftstheoretische Betrachtung. [Experimental knowledge of heredity, a scientific-theoretic observation.] *Naturwissenschaften* 11: 833-842. 1923.—A critical survey is given of the experimental evidence bearing on inheritance, put forth by the Neomendelians followed by a philosophical discussion of the attempt to make of universal application the Mendelian rules of inheritance holding for certain small sections of the plant and animal world.—*Orton L. Clark*.

1413. HÖSTERMANN, G. Zur Frage der Xenienbildung bei gärtnerischen Kulturpflanzen. [The question of xenia in cultivated garden plants.] *Angew. Bot.* 6: 232-242. 1924.—Crosses were made between apples varying in color, shape and other characters, and the characteristics of the resulting seedlings are noted. No definite case of xenia was found. Pea pods in crosses between distinct types also showed no immediate effect of the ♂. The question of the cucumber and melon crossing is discussed.—*Richard Wellington*.

1414. HUTCHESON, T. B., AND T. K. WOLFE. The effects of fertilizers and hybridization on maturity and yield of corn. *Virginia Agric. Exp. Sta. Tech. Bull.* 27. 20 p. 1924.—Data collected in 1916-1917 on the yield and maturity of 1st generation hybrids as compared with their parents are presented. Six hybrids were studied involving 5 commercial varieties. In all 6 cases the hybrids outyielded the average of the parents, but in 3 of the 6 cases the hybrids were inferior in yield to the better parent. With respect to maturity, when the average of the 2 years is considered the hybrids were earlier than their parents in all except 1 instance.—*J. H. Kempton*.



1415. HUXLEY, JULIAN S. **Practical biology.** School Sci. Rev. [London] 6: 16-23. 1924.—Eight types of experiments which can be profitably carried out in a general biology course are described and sources of material given where necessary. (1) Genetics. Eye characters in the Amphipod, *Grammarus chevreuxi*, can be used to illustrate the difference between phenotype and genotype; how Mendelism is applied in practice; 1 factor, 2 factor and back crosses; linkage ("coupling" and "repulsion"); and the gradual development of male secondary characters. (2) Endocrine glands. The effect of thyroid is demonstrated by feeding fresh thyroid, thyroid juice, or desiccated thyroid to tadpoles. Iodine also accelerates metamorphosis. The morphogenetic (a) and transitory (b) effects of endocrine organs are illustrated by a study of the pigmentary effect of injections of pituitary extract into pithed frogs. (3) Regeneration. Hydra of all species, Planarians and fresh water Oligochaetes (especially *Lumbriculus*) illustrate regeneration simply and well. Transverse, oblique and longitudinal cuts should be made. Restitution (by new growth) and morphallaxis (rearrangement of old tissues) in regeneration can be studied. (4) Reduction. Planarians when starved can live on their own tissues and reduce to a surprising degree. The process can be reversed by feeding. (5) Grafting. Hydra and moth pupae can be used. (6) Dedifferentiation and resorption. Small branches of *Obelia* and *Campanularia* with 1 to 10 hydranths, kept in small capsules of sea water (not renewed), illustrate dedifferentiation and resorption. (7) Dissociation and reconstitution. *Sycon* or *Grantia* are good material for this experiment. (8) Value of biometric methods. This exercise consists of measuring parts of the shore crab (*Carcinus maenas*) and plotting curves which show the relative growth of parts in the ♂ and ♀.—*Dorothy I. Neff.*

1416. IKENO, SEITIRO. **Studien über die Vererbung der Blütenfarbe bei *Portulaca grandiflora* II.** [Studies on the inheritance of dark red color in *Portulaca grandiflora*.] Japanese Jour. Bot. 2: 45-62. 1924.—Special methods devised for seed germination are briefly described. The genetic relations of 6 pairs of genes responsible for the colors purple, orange flesh-colored, red and 3 kinds of whites are discussed. In the  $F_2$  of the cross purple  $\times$  orange and the back cross of the  $F_1$  to a double recessive white, there appeared to be complete linkage between the factors *R* and *B*. When  $F_2$  purple heterozygotes are back crossed to the double recessive white pollen parent 16% of crossing over was obtained. When the  $F_2$  purple heterozygote is used as the pollen parent in the back cross 9% of crossing over is obtained. The cause of the different results obtained when  $F_1$  and  $F_2$  purple heterozygotes are used in back crosses has not been explained. No other case of linkage among these genes has been found.—*J. L. Collins.*

1417. IMAI, YOSHITAKA. **Genetic studies in morning glories. IV.** (Japanese.) Bot. Mag. Tôkyô 35: (73)-(83). 1921.—There are several different genetic types in the white-flowering Japanese morning-glory. The commonest types of the white flower are those relating to the so-called complementary factors in color formation. White flower with green stem  $\times$  colored flower with colored stem and white flower with colored stem  $\times$  colored flower with colored stem gave both  $F_1$  of colored flower with colored stem, but in the subsequent generation they segregated into colored and non-colored forms, just like the respective parents, in monohybrid fashion. White flower with green stem  $\times$  white flower with colored stem gave the colored flower the colored stem and the  $F_2$  generation composed of 9 colored flowers with colored stem and 7 whites with either green or colored stem.—In a  $F_3$  family of a cross, white flower with colored stem  $\times$  blue-spotted flower (cream ground color) with spotted stem, were found some green-stemmed white flowers which are considered very rare, due to the crossover occurring between certain factors. The genetic aspect of the origin of these white flowers is very complex, and is explained in some detail.—Another white flower with green stem which has appeared in the progeny of a colored flower is found to be due to the combination of 3 recessive factors that is indifferent to the so-called complementary factors.—*Author.* (Courtesy Japanese Jour. Bot.)

1418. IMAI, YOSHITAKA. **Genetic studies in morning glories. V.** (Japanese.) Bot. Mag. Tôkyô, 35: (225)-(238) 1921.—In the present paper the summary of the known cases of linkage in the Japanese morning glory is given together with some new data. Repulsion data of variegated and punched leaves were obtained in the  $F_2$  of a hybrid, the results confirming the occurrence of the crossover of about 13%, which is calculated from the coupling segregation. The crossover value of contracted habit and white-margined flower was ascertained as about

1%. Some flower colors are almost always accompanied by certain flower-tube colors. The phenomena may be considered as due to either linkage or multiple allelomorphs. Lastly Miyazawa's remarkable results are criticized and it is pointed out that his data may be most naturally explained by the linkage hypothesis. There are, at present, 8-9 cases of linkage in this plant.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1419. IMAI, YOSHITAKA. Genetic studies in morning glories. VI. (Japanese) *Bot. Mag. Tôkyô* 36: (45)-(48). 1922.—In the 3rd report of the author's studies in morning glories, the genetic aspect of the flower-colors of 2 races of *Ipomoea purpurea*, W. D. (white double-flowered) and R. S. (red single-flowered), were fully described. Another race denoted by W. S. bearing white, single flower, was crossed with the 2 races cited above, and the genetic relationships of the progeny of the hybrids were analyzed, the results being represented by the following constitution: R. S., *RRSSUdd*; W. D., *RRssuuDD*; W. S., *rrSSUdd*. The allelomorphs given above are considered as having effects as follows: *R.r-r* is responsible for white flower with green stem, and the colored condition in both flower and stem is caused by *R*. The heterozygotic flower is intermediate in color.—*S.s*—The factor *s* makes both flower- and stem-color dilute, while in the presence of *S* the color becomes more intense. The effect of both factors can only become visible through the presence of *R*. Biotypes resulting by the interaction of these 2 allelomorphic pairs are: *RS*, intense flowered series with intensely colored stem; *Rs*, faint flowered series with dilute stem; *rS* or *rs*, white flower with green stem.—*U.u*—In the presence of *u*, 5 colored spots are formed in the rays of the corolla, leaving the other parts colorless. The heterozygotic flower is intermediately colored. In the co-operation of *u* and *s*, both in double doses, apparently white flower with dilute stem is formed.—*D.d*—*D* is responsible for dilution of flower-color.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1420. JENNINGS, H. S. Proportions of defectives from the northwest and from the south-east of Europe. *Science* 59: 256-257. 1924.—The author objects to the statement of the Eugenics Committee of the U. S. A. that a percentage limitation of immigration based on the census of 1890 would reduce the proportion of the mental defectives and other socially inadequate classes. For, twice the proportion of Irish would be admitted on the new basis and this country provides an exceptional number of inadequates. He concludes that on the new basis "a European-born population constituted as in 1890 would contribute practically exactly the same number of institutional defectives as an equal European-born population constituted as in 1910."—*C. B. Davenport.*

1421. JÜRGENS, L. Über die Heredität der multiplen Exostosen. [Inheritance of multiple exostoses.] *Arch. Psychiatrie u. Nervenkrankheiten* 61: 103-116. 1919.—Especially the cartilaginous form of multiple exostoses is characteristically hereditary. Two new cases are cited: case 1 is an 18 year old boy, having large exostoses, 1 the size of an apple on the right radius, others on the humerus, left radius, ulna, humerus, scapula and on both legs—36 altogether. Case 2 is the father of case 1, is 52 years old, and has exostoses on the inner side of both tibiae; at the upper end, symmetrical exostoses the size of a crabapple; 6 altogether. The father's ancestry and sibs are not known to have exostoses. Reinecke, in 1891, described 35 cases of multiple exostoses: one case traced through 5 generations; 2 cases through 4 generations; 15 cases through 3 generations; 12 cases through 2 generations and 6 cases in several sibs.—*C. B. Davenport.*

1422. KAKIZAKI, YOITI. Linkage phenomena in aduki-bean. (Japanese.) *Idengaku Zasshi* [Japanese Jour. Gen.] 1: 117-125. 1 pl. 1922.—The hybridisation between 2 races of Aduki-bean, Miyako  $\times$  Donsu was carried out. The distinguishing characters of the 2 races as well as of the  $F_1$  generation are as follows: (1) "Miyako" stem, green; seed-coat, non-spotted; ripe pod, brown. (2) "Donsu" stem, pale purple; seed-coat, black-spotted; ripe pod, blackish brown. (3) The  $F_1$  stem, deep purple; seed coat, black-spotted, much less than in Donsu; ripe pod, blackish-brown, identical with Donsu. According to the results of culture of  $F_2$  and  $F_3$  generations it was determined that the difference of each of the above named characters of seed-coat and ripe pod is due to 1 single factor, *S* and *B*, respectively, and also that of stem character to 2 factors *P* and *I*, the former causing the purple color and the latter intensifying it.—The author has further ascertained the facts that the green or purple stem is



always (1) correlated with non-spotted or spotted seed-coat, respectively; and (2) with brown or blackish brown pod, respectively. Such correlations might be caused, if 2 correlated characters in each case were due to one and the same factor, but the author thinks it probable, from the analogy of Takahasi and Hukuyama's investigations, that they are due to 2 separate factors which are in complete linkage. On the basis of such considerations and in accordance with the chromosome hypothesis he thinks that the following formulas are applicable to Miyako and Donsu respectively: Donsu,  $(PS) (PS) (iB) (iB)$ , Miyako,  $(ps) (ps) (Ib) (Ib)$ ,—the factors enclosed in parentheses being supposed to lie very near on the same chromosome and consequently to be linked.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1423. KAMMERER, PAUL. **The inheritance of acquired characters.** (Translated by A. PAUL MAERKER-BRANDEN) 414 p., 43 fig. Boni & Liveright; New York, 1924.—The subject matter of this volume is divided into a biological and a eugenical part. The 1st part, as indicated by the chapter headings, is devoted to such subjects as: Inherited and acquired characteristics; slaves of the past or captains of the future; the importance of breeding experiments; after-effect only or genuine inheritance; several chapters on experiments on various animals—salamanders, the midwife toad, beetles, butterflies, Ciona; what are "hereditary characteristics;" controversy about the inheritance of acquired characteristics; direct adaptability or selection; the impotency of selection; Mendelism and Lamarckism reconciled; enduring effect or number of generations; xenias and telegony; body and germ plasm; why mutilations are not hereditary; a chapter each on the inheritance of alcoholism, diseases and immunity, acquired characteristics in man, and callosities of the human sole; the origin of species by means of direct adaptation; where does evolution stand today. Under the eugenics part, Darwinism and socialism are discussed and a chapter each is devoted to inheritance in relation to: Race theory, the "melting pot" America, mutual aid, agriculture, child adoption, old age, rejuvenation, ductless glands, and genius. "Productive eugenics" and "aspect" are the 2 final chapter headings. A bibliography of 35 pages is appended.—*Orland E. White.*

1424. KATÔ, SIGEMOTO, AND ZYUN'ITI ISIKAWA. **On the heredity of the pigments of red rice.** (Japanese.) *Idengaku-Zasshi* [Japanese Jour. Genetics] 1: 1-7. 3 fig. 1921.—The reddish brown grains (so-called "red rice") produced by the races, such as Kuromoro, Akatôbôsi, Haguro, Akamuro, etc., contain the red pigment chiefly in large cells of their seed-coats, and less in pericarp cells. The  $F_1$  hybrid Kuromoro (red)  $\times$  Oobamoti (normal white) and its reciprocal give rise in  $F_2$  to offspring producing red and white rice respectively in the ratio 3:1, while from the  $F_1$  hybrid Kuromoro (red)  $\times$  Wasesinriki (white) the authors obtained in  $F_2$ , not only red and white rice offspring, but also those producing yellowish brown rice; they are in the proportion of 9 reds: 3 yellows: 4 whites. The results of the hybridisation between some other races and Kuromoro as well as those just given above led the authors to the conclusion that 3 factors are necessary for the production of reddish brown pigment, that Kuromoro contains all of them, and that white races of rice contain either 2 or only 1 of them, that is, if these factors are indicated by  $A$ ,  $B$ , and  $C$ , Kuromoro contains  $A + B + C$ , Oobamoti  $B + C$ , some others  $A + C$ , still others, as Wasesinriki,  $B$  only. The chemical examination has proved that the reddish as well as the yellowish brown pigments belong, not to anthocyanin, but to protoeyanin. Finally, the authors make a short statement about the chemical nature of the pigments contained in the extremities of glumes and awns of Genkimoti, Sirotôbôsi, and their hybrid.—*Authors.* (*Courtesy Japanese Jour. Bot.*)

1425. KAUP, J. **Statistisch-biometrische Vererbungsgesetze und Polymeriehypothese nach Variabilitätsstudien am Menschen.** [Statistical biometrical laws of inheritance and the polymere hypothesis based on variability studies in men.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 33: 350-355. 1924.—The coefficients of variation for height, transverse measurements, and weight in man are related to each other as 1:2:3. Furthermore, there is little or no correlation between variations in body weight and body height as compared to variations in the weight of brain, liver and kidney. These observations lead to various deductions as to human types and to the conclusion that it is difficult to interpret the findings on the basis of the gene theory.—*C. H. Danforth.*

1426. KEELER, CLYDE E. **The inheritance of a retinal abnormality in white mice.** *Proc.*

Nation. Acad. Sci. [U. S. A.] 10: 329-333. 1924.—An abnormality in the eyes of white mice is recorded. The author states that it is strictly retinal in extent, and revealed by microscopic examination only. Microscopic sections showed total absence of the visual cells (rods), the external nuclear layer, and the external molecular layers. The ganglionic cells and optic nerve fibers appeared normal; the internal limiting membrane was present. The author suggests that this may be the result of degeneration, or, more probably, a suspension of development. It appears to be inherited. A pedigree chart is shown. Embryological, histological, and genetic studies of the abnormality are in progress.—*E. E. Jones.*

1427. KELLY, J. P. Seed progeny of a potato with faintly coloured tubers. Jour. Genetics 14: 197-199. 1924.—The Red McCormick potato has tubers which are essentially cream with light flushes of carmine in and about the eyes. Guarded selfings of Red McCormick plants gave 8 offspring which were Red McCormick in appearance, 5 cream (no trace of anthocyanin), 6 with uniformly distributed carmine, 2 of which were rather intensely colored. Ten hybridizations of Red McCormick and cream-tubered varieties of Rural gave 205 seedling plants. Of these 31 were Red McCormick, 32 had pigmentation also light but evenly diffused over the tuber, 44 had color uniformly distributed but deep in shade, and 98 were cream. Red McCormick is evidently heterozygous for some simple basic color factor that is called *B*. The fact that the majority of colored ones are light while the intensely colored plants are relatively few may point to a dominant diluting factor *D*, also heterozygous. A factor *M*, also heterozygous, giving the characteristic restriction of color in Red McCormick is named and assumed to function only in the presence of *D*. Red McCormick would then be *MmBbDd*, and Rurals *mmbbdd*. The 8 possible gametic combinations determine the character and frequencies of the hybrid offspring: (1) MBD, Red McCormick; (2) MBd, dark, evenly colored; (3) mBD, light, evenly colored; (4) mBd, dark, evenly colored; (5) MbD, cream; (6) Mbd, cream; (7) mbD, cream; (8) mbd, cream. The number of plants with dark, evenly colored tubers actually observed, falls somewhat short of expectations, but in other features the theoretic and actual agree rather closely. More confirmatory data are needed.—*Dorothy I. Neff.*

1428. KOPEĆ, S. On the heterogenous influence of starvation of male and of female insects on their offspring. Biol. Bull. 46: 22-34. 1924.—The author states the results of experiments undertaken to ascertain to what degree starvation of either of the parents separately has an influence on the total development of their progeny. The moth, *Lymantria dispar*, was the subject of these experiments, and the control methods of feeding were necessarily during the larval stage since the adults do not feed. Tables are given to show the influence of starvation of the ♀ upon number and size of eggs produced; and of the starvation of either parent on the percentage of caterpillars hatched, their comparative weight, the percentage of caterpillars which underwent pupation, and the percentage of chrysalids from which moths emerged. The unfavorable influence of starvation upon females is evidenced in a reduction of the number of eggs laid, but the capacity of the egg to develop is not changed. The influence of starvation upon males does not affect the capacity of the spermatozoa for stimulating eggs to development, but there is a larger mortality of caterpillars and chrysalids. In all cases the pupal stage in the offspring was shortened and metamorphosis accelerated. Such behavior of the progeny of starved specimens is believed to support the opinion that insect metamorphosis is checked by the secretional function of the larval brain.—*Grace Sandhouse.*

1429. KOPEĆ, STEFAN. Studies on the inheritance of the weight of new-born rabbits. Jour. Genetics 14: 241-263. 1924.—Studies were made of birth weights of 825 un-nursed young in litters of 4 to 6, in reciprocal crosses between Himalayan and Silver Gray rabbits. The same females that gave the pure bred young were used for the crosses. The average weight of the  $F_1$  generations was somewhat above the intermediate birth weight of the parental races, with variability unchanged. The average weight of the  $F_2$  was only slightly different, though the variability was much greater than in the  $F_1$ . These results agree with studies by others on adult rabbits and are similarly interpreted as governed by polymeric factors. Pattern and weight segregate separately. Ten tables of individual birth weights and biometrical constants, 7 other tables of comparisons and 2 figures of frequency distributions, are given.—*E. C. MacDowell.*

1430. KOTOWSKI, F. Studja biometryczne nad czereśniami i wiśniami. [Biometrical



studies on sweet cherries (*Prunus avium*) and sour cherries (*Prunus cerasus acida recta*).] (English summary.) Pam. Pánst. Inst. Nauk. Gosp. Wiejsk. w Pulawach 1, A: 213-224. 1921.—Variability of fruit and leaves in sweet black cherries (*Krugersschwarze Herzkirsche*) follows unimodal frequency curves with skewness which is positive for fruit and negative for leaves. The coefficient of variability for fruit is 15.3 and for leaves 28.6. The weight of fruit grown in pairs or triplets is smaller than that of fruit grown singly. The coefficient of correlation between length of leaf and length of lamina was found to be  $+0.996 \pm 0.005$ ; between length of petiole and length of lamina  $+0.416 \pm 0.051$ ; length of petiole and length of leaf  $+0.234 \pm 0.059$ ; weight of fruit with kernel and weight of fruit without kernel  $+0.951 \pm 0.021$ ; weight of fruit with kernels and weight of kernel  $+0.408 \pm 0.059$ ; weight of fruit without kernel and weight of kernel  $-0.153 \pm 0.061$ . The smallest coefficient of variability (7.86) was found for fruit growing in pairs.—*M. Demerec*.

1431. KRONACHER, C. *Vererbungsversuche und -Beobachtungen an Schweinen*. [Investigations and observations on heredity in swine.] Zeitschr. Indukt. Abstamm. u. Vererb. 34: 1-120. 1924.—This paper contains detailed reports on numerous experiments performed by the author during the years 1910-1916. The purpose is to demonstrate the validity of the theory of inheritance of unit characters in domestic animals. The results, however, are not presented on the basis of characters but on the individual results of crossing animals of a number of German breeds of swine. The observations cover the following points: Inheritance of color, presence of wattles, shape and position of ears, the cloven hoof as an abnormality, and different points regarding body type. Notes are also made concerning growth and the deleterious effect of inbreeding.—*Tage U. Ellinger*.

1432. LENZ. [German rev. of: GÜNTHER, HANS F. K. *Rassenkunde des deutschen Volkes*. (Ethnology of the German peoples.) 3 Aufl. 514 p. 537 fig. J. F. Lehmann Gebrüder: München, 1923.] Arch. Rass.-u. Gesellschaftsbiol. 16: 99-111. 1924.

1433. LENZ, FRITZ. *Bemerkungen zur Variationsstatistik und Korrelationsrechnung und einige Vorschläge*. [Variation statistics and correlation calculations.] Arch. Rass.-u. Gesellschaftsbiol. 15: 398-415. 1924.—The author points out the danger of assuming that the use of complicated mathematical formulas necessarily gives greater exactitude to results. He argues that simpler formulas can be used than those of the Pearsonian School, with better logical foundation and great saving of labor, urges the use of mean error in place of standard deviation, and instead of product-moment-correlation-coefficient, proposes the following:

$$k = \frac{1}{2} \left( \frac{Sx_1 + Sx_4 - Sx_2 - Sx_3}{Sx_1 + Sx_4 + Sx_2 + Sx_3} + \frac{Sy_1 + Sy_4 - Sy_2 - Sy_3}{Sy_1 + Sy_4 + Sy_2 + Sy_3} \right)$$

where 1, 2, 3, and 4 indicate the quadrants of the 4-fold table formed with the means of X and Y for the division lines,  $Sx_1$  denotes the summation of the X deviations of the terms which fall in quadrant 1, etc. Several numerical illustrations are given, comparing the results of the 2 methods.—*Sylvia L. Parker*.

1434. LINDSTROM, E. W. *Complementary genes for chlorophyll development in maize and their linkage relations*. Genetics 9: 305-326. 1924.—Three different genes for complete albinism in maize seedlings were found to be genetically distinct. These genes have the designations  $W_1$ ,  $W_2$  and  $W_3$ . Linkage tests indicate that  $W_1$  belongs in the *Y-Pl-Sm* group,  $W_2$  belongs in the *R-L-G* group while  $W_3$  is shown to be independent of these 2 groups as well as the *B-Lg* and *C-I-Sh-Wx* groups. Probable error methods for use with  $F_2$  distributions involving linkage are suggested.—*J. H. Kempton*.

1435. LONGLEY, ALBERT E., AND GEORGE M. DARROW. *Cytological studies of diploid and polyploid forms in raspberries*. Jour. Agric. Res. 27: 737-748. 3 pl. 1924.—This article deals with the chromosome number of representative species and hybrid forms from many groups of *Rubus* of the subgenus *Idaeobatis*. The haploid chromosome number in diploid forms was found to be 7. A small, but characteristic group of raspberries was found to be made up of triploid and tetraploid forms. The authors point out the possibility of increasing raspberry forms by crosses among groups with different chromosome numbers. They also suggest that polyploid raspberries may be crypthybrids between *Idaeobatis* and *Eubatus Rubi*.—*A. E. Longley*.

1436. LONGO, A. *Fecondazione artificiale dell'uva*. [Artificial pollination of the grape.]

Nuovi Ann. Agric. Min. Econ. Naz. Italy 4: 61-78. 1924.—The effect of ringing canes and of artificially fertilizing the flowers of certain European vines is discussed. Although the setting of fruit varies greatly with the weather at blossoming time, ringing prevented the dropping of many small abortive berries and increased the yield materially. Artificial fertilization produced still larger berries and clusters and in the variety, Gros Colman, the clusters were compact even when 50% of the small green berries had been removed. Considering the fact that ringing is detrimental to the vine and less effective in producing large clusters, artificial fertilization is advocated.—*Richard Wellington*.

1437. LOTSY, J. P. *Die Bedeutung Mendel's für die Deszendenzlehre*. [Mendel's interpretation of the theory of descent.] *Studia Mendeliana*. P. 149-160. Typos: Brunn, Czechoslovakia, 1923.—Mendel's idea regarding the law of descent was based upon the recognition of 2 classes of organisms, those that constantly produce a single type of offspring and those capable of producing more than 1 type of offspring or in other words the existence of homozygous and heterozygous individuals. The bulk of the article is concerned with citations gleaned from writings of different biologists, which are used by the author as evidence that new species in nature have their origin in inter-racial and inter-specific hybridization.—*J. L. Collins*.

1438. LOTSY, J. P., AND K. KUIPER. A preliminary statement of results of Dr. Houwink's experiments concerning the origin of some domestic animals. *Genetica* 5: 149-176. 3 pl. 1923.—Houwink's collection of specimens representing 5 species of the genus *Gallus* indicates that there is considerable variation in plumage color in the wild state, which is not due to crossing with domestic poultry. It is concluded that the species, *G. bankiva*, evidently embraces a number of forms which differ from one another to a lesser extent than from the other species of the genus *Gallus*.—*H. C. McPhee*.

1439. LOVE, H. H. A modification of student's table for use in interpreting experimental results. *Jour. Amer. Soc. Agron.* 16: 68-73. 1924.—The table gives the odds values calculated from the probability values in table XXV, page 36, of Pearson's Tables for Statisticians and Biometricians.—*Sylvia L. Parker*.

1440. LOVE, H. H., AND A. M. BRUNSON. Student's method for interpreting paired experiments. *Jour. Amer. Soc. Agron.* 16: 60-68. 1924.—In interpreting the results of experimental work, when the experiments have been so conducted that the series of observations naturally arrange themselves in pairs, as in comparing yields of 2 varieties over a series of years or localities, the authors urge that in such cases the method proposed by "Student" in *Biometrika* in 1908, which takes into consideration the parallelism of paired observations and gives weight to the amount and consistency of individual gains in estimating the significance of the mean difference, is better than the ordinary method of merely testing whether the means of the 2 series are significantly different. Several numerical illustrations are given.—*Sylvia L. Parker*.

1441. LUNDBORG, H. *Das schwedische Staatsinstitut für Rassenbiologie*. [The Swedish state institute for eugenics.] *Arch. Rass.-u. Gesellschaftsbiol.* 14: 315-328. 1922.—A sketch of plans for his Institute at Upsala is given. It is the author's ideal that such an institute should include 4 departments; genealogical and medico-demographic; anthropological; experimental biological; movement of heredity.—*C. B. Davenport*.

1442. MCCLINTOCK, J. A. The transmission of nematode resistance in the peach. *Science* 58: 466-467. 1923.—Peach seedlings resistant to the root-knot nematode were grown by the author from pits obtained from Florida. The 2nd generation of these seedlings was also free from root-knots, indicating that the factor for resistance is seed transmitted. Work on this problem is being continued with a view to practical application.—*Charlotte Elliott*.

1443. MALLOCH, WALTER S., AND FRANCES W. MALLOCH. Species crosses in *Nicotiana*, with particular reference to *N. longiflora* × *N. Tabacum*, *N. longiflora* × *N. Sanderae*, *N. tabacum* × *N. glauca*. *Genetics* 9: 261-291. 1924.—In the genus *Nicotiana* many species crosses were made, and their hybrids studied. A number merely germinated, the young seedlings soon dying. Among these were the hybrids *N. Bigelovii* × *N. longiflora*, *N. Bigelovii* var. *multivalvis* × *N. Sanderae*, *N. rustica* × *N. Langsdorffii*, *N. Tabacum* × *N. alata* var. *grandiflora*, *N. Tabacum* × *N. Longiflora*. Hybrids may be weak or vigorous yet character-



ized by practical sterility in either case. The hybrid between *N. longiflora* and *N. Tabacum* var. Little Dutch is a very weak form, while that between *N. longiflora* and *N. Sanderæ* is a vigorous form. The success of species crossing may depend upon a number of factors, including environmental conditions, the variety within the species used and the compatibility of the reaction systems involved.—*H. A. Allard.*

1444. MANGELSDORF, P. C. **Waxy endosperm in New England maize.** *Science* 60: 222-223. 1924.—Waxy seed have been found by D. F. Jones on 2 hand-pollinated ears of Sanford's White Flint. These ears were grown from a lot of open-pollinated seed obtained from a farmer near Kent, Connecticut. Genetic tests of this endosperm with the waxy endosperm from China prove that the 2 are identical. There is no indication of the Sanford's White Flint ever having been hybridized with the Chinese Waxy variety and the strain carrying the waxy endosperm is typical of the Flint variety in type of plant, ears and grain. The author notes that the appearance of this peculiar type of endosperm in a New England variety of maize furnishes a further bit of evidence against the theory of a pre-Columbian distribution of maize outside of the American continent.—*J. H. Kempton.*

1445. MAVOR, J. W., AND H. K. SVENSON. **An effect of X-rays on the linkage of Mendelian characters in the second chromosome of *Drosophila melanogaster*.** *Genetics* 9: 70-89. 9 fig. 1924.—It is shown that X-ray treatment of ♀ flies brings about an increase in the crossover values for the black to curved region of the 2nd chromosome. A treatment of slightly over 3 minutes causes an increase in black-to-purple, lasting for 12 days. This result is contrasted with that of Plough for high temperature and it is concluded that X-ray treatment does not directly affect the crossing over but produces an effect on the mechanism which results in an increase in crossing over.—*H. H. Plough.*

1446. MENDIOLA, N. B., AND J. O. UNITE. **Breeding ornamental Hibiscus. II. Artificial and natural selection for dwarf, medium and tall seedlings.** *Philippine Agric.* 13:45-47. 1924.—Dwarf and medium tall seedlings of Hibiscus were found to have less chance of surviving than the tall types when grown in a plot. In pots, however, the smaller types were found to thrive and make more attractive ornamental plants. Dwarf varieties are especially desirable as potted plants.—*Richard Wellington.*

1447. METZ, C. W., AND J. F. NONIDEZ. **The behavior of the nucleus and chromosomes during spermatogenesis in the robber fly, *Lasiopogon bivittatus*.** *Biol. Bull.* 46: 153-164. 1 pl. 1924.—The behavior of the chromosomes during spermatogenesis appears to be much the same as in another robber fly, *Asilus*, described by these authors. An interesting difference in this form is the indication that the chromosome threads are at the core of a thick hyaline mass or envelope, sufficiently solid to transform the nucleus into a lobed structure. This condition may be widespread.—*H. H. Plough.*

1448. MIYAKE, KIICHI, AND YOSHITAKA IMAI. **Genetic experiments with morning-glories. II. (Japanese.)** *Bot. Mag. Tōkyō* 35: (1-9). 1921.—The authors have studied the hereditary behavior of the following antagonistic characters in morning-glory: Self-colored and variegated leaf, green, and yellow leaf, simple and double flower due to petaloidy, and simple and double flower called "Botanzaki" due to proliferation. In each pair of characters above mentioned the 1st was found to be dominant to the 2nd, and monohybrid segregation was observed. All recessive genes under discussion are supposed to lie on different chromosomes.—*S. Ikeno. (Courtesy Japanese Jour. Bot.)*

1449. MIYAKE, KIICHI, AND YOSHITAKA IMAI. **Genetic experiments with morning-glories. III. (Japanese.)** *Bot. Mag. Tōkyō* 35: (101)-(115). 11 fig. 1921.—The authors have dealt with the inheritance of an abnormal flower, the so-called *Shishizaki*. In *Shishizaki* the petals are more or less curled up and feathered, often split into numerous slender pieces. The *Shishizaki* behaves as a simple Mendelian recessive to the normal. The plant with *Shishizaki* flowers shows certain characteristic modifications in the leaves and cotyledons. The heterozygote carrying the *Shishizaki* factor can be readily recognized from the dominant homozygote by the leaves. Thus the segregation ratio is 1:2:1.—The *Shishizaki* flowers are sterile, so that this kind of flower can only be obtained by segregation from the heterozygote. The *Shishizaki* flower has a high degree of linkage with the heart-shaped, so-called round leaf which is also a simple Mendelian recessive to the normal, its crossover being about 1.2%.—*Authors. (Courtesy Japanese Jour. Bot.)*

1450. MIYAKE, KIICHI, AND YOSHITAKA IMAI. Genetic studies in barley. I. (Japanese.) Bot. Mag. Tôkyô 36: (25)–(38). 1922.—Studying the genetic behavior of barley, the authors detected 16 pairs of allelomorphs affecting plant-habit, ear, glume, awn, grain, etc. The allelomorphs responsible for the development of the awn of the lateral rows of the ear, consist probably of 3 factors, that is, they form multiple allelomorphs. Several linkages were observed, and the authors found 2 large linkage groups of factors. One of them consists of 4 or probably 5 factors and the other of 5 factors.—Authors. (Courtesy Japanese Jour. Bot.)

1451. MIYAKE, KIICHI, AND YOSHITAKA IMAI. On the inheritance of flower-color in *Sisyrinchium angustifolium*. (Japanese.) Bot. Mag. Tôkyô 35: (261)–(265). 3 fig. 1921.—Crosses were made between 2 races of *Sisyrinchium angustifolium* which differ only in the flower-color. The flower of one is bluish-purple in color; that of the other is white with colored centre. The color of the  $F_1$  flower is almost like that of the latter, being white with colored eye. The white dominance, however, is not complete, the colored central tips of the eye of the hybrid flower being half way elongated towards the tips of the petals. As these 2 color distributions are due to a single factor difference, the segregating ratio is 1:2:1. In the  $F_2$  population, some dwarfs have appeared with which genetic experiments are now under way.—Authors. (Courtesy Japanese Jour. Bot.)

1452. MIYAKE, K., Y. IMAI, AND K. TABUCHI. On the genetic behavior of some factors in adzuki-bean. (English summary.) Bot. Mag. Tokyo 38: 1–9. 1924.—A cross between colored stem and green stem in the  $F_2$  generation gave a ratio of 9 colored: 7 green which the author explains by the interaction of 2 complementary factors. The parents of the above cross also differed in color pattern of the seed coat, one having self black and the other red eyed white seeds. Self black seeded hybrids in  $F_2$  gave self black, self red, red eyed white with black mottling and red eyed white in a ratio of 9:3:3:1. There is complete correlation between stem color and seed pattern, the plants with colored stems having only self black seeds and the green stems having any 1 of the remaining 3. This correlation is explained by assuming linkages between the factors for stem color and seed pattern or by assuming multiple effects of factors for stem color or seed coat.—Charlotte Elliott.

1453. MIYAZAWA, B. Inheritance of leaf color in barley. Idengaku-Zasshi [Japanese Jour. Genetics] 1: 9–12. 1921.—Green and light yellow individuals in 1 of the  $F_4$  of Tikurin  $\times$  Goldenmelon barley segregated in the ratio of 3:1. When selfed, such green individuals gave only green progeny in 1 case, but in another the same 3:1 segregation took place. Usually the light yellow plants soon succumbed, probably because of cold, but when protected they gradually changed into the viable green condition. The yellows were evidently recessives. An agreement with the results of Miles with corn is indicated.—Author. (Courtesy Japanese Jour. Bot.)

1454. MORGAN, T. H. The artificial induction of symmetrical claws in male fiddler crabs. Amer. Nat. 58: 289–295. 1924.—Further experiments sustain the conclusion that symmetry in the ♂ fiddler crab is induced in the young crabs by the accidental loss of 1 claw. Two large claws are at first present. If one is lost, the other one becomes the “fiddle.” The new one, regenerated, becomes the permanent small claw. In addition, if both are lost, 2 permanent small ones are regenerated.—H. H. Plough.

1455. MOTTRAM, J. C. On the function of secondary sexual characters. Sci. Prog. 18: 420–425. 1924.—It is suggested that secondary sexual characters should be viewed from the point of view of their utility to the pair rather than to the individual. Many examples in birds are thus considered and it is indicated that there is, thus, a special value in secondary sexual characters, which is of no individual importance.—H. H. Plough.

1456. NACHTSHEIM, H. Vererbungsversuche an Schweinen: Die Vererbung der Zitzenzahl. [Genetic investigations in swine. The inheritance of nipple (teat) number.] Zeitschr. Indukt. Abstamm. u. Vererb. 33: 307–311. 1924.—A condensed report is given of breeding experiments involving 1500 swine of various European domestic and wild races, conducted at the swine experiment station at Ruhlsdorf, near Berlin. Individual variation in nipple number was found to be very great, from 8 to 18 (4 to 9 pairs). Three groups of nipples were distinguished by position and occurrence on the animal (1) “normal” functional nipples (7 pairs),



(2) supernumerary nipples occurring between the normal nipples, most frequently between the 3rd and 4th and frequently functional, (3) posterior or rudimentary nipples always non-functional, lying caudad to the normal pairs.—The inheritance of rudimentary nipples was found to be more complex than the simple sex-linked mode of inheritance proposed by Wentworth, and aside from an indication that the presence of rudimentaries is dominant and may depend on more than 1 factor, it remains unsolved. The presence of supernumerary nipples was found to be due to dominant factors, inherited independently of those affecting rudimentary and normal nipples.—Of the normal nipples, pairs 1, 3, 4, 5, and 7 were found to be practically always present though somewhat variable in development, and they are assumed to have the same genetic basis in all of the races investigated. Pairs 2 and 6 are extremely variable and much of this variation is due to multiple genetic factors. In crosses, higher nipple numbers appeared to be dominant. Factors for high nipple number are assumed to be more or less common in European domestic swine but lacking in European wild swine which lack the 2nd and 6th pairs of nipples. Crosses between wild and domesticated swine resemble the wild form in nipple number. Factors for high nipple number are assumed to have been introduced into domestic swine from the Asiatic striped swine *Sus vittatus*, which has given rise to the many-nippled and fecund Chinese swine.—L. C. Dunn.

1457. NAGAI, ISABURO. On the hybrid of *Mosla Orthodon* and *Mosla Hadai*. (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 1: 87-99. 6 fig. 1922.—A general summary of the breeding experiment on the species hybrid *Mosla Orthodon* × *M. Hadai* and *N. Hadai* × *M. Orthodon* up to F<sub>4</sub> is given. Though the 2 species are closely allied in morphological characters, the hybrid gives rise to a number of new forms. Different characters, like the height, form of spike, branching habit, etc., segregate independently, indicating that a large number of genetic factors are involved. *M. Orthodon* produces thymol in the volatile oil whereas *M. Hadai* produces no thymol but its isomer, carvacrol, which is not crystallizable and is of no practical value. This production of very closely allied chemical substances, thymol and carvacrol, is shown to be governed by genetic factors. Owing to the transgressive nature of segregation in most of the characters studied, no intensive Mendelian analysis has been presented.—Author. (Courtesy Japanese Jour. Bot.)

1458. NEMEC, B. O potomstvu pražských samičích jehlančových topolů. [On seedlings of a female pyramidal poplar.] (German summary.) Studia Mendeliana. P. 169-174. Typos: Brunn, Czechoslovakia, 1923.—Occurrence and genetic behavior of certain female pyramidal poplars growing on islands near Prague are discussed. Most pyramidal poplars are males and only a few records of females have been made. The progeny of these females was exceedingly variable. Various hypotheses to account for these results are discussed, among them hybridization of *Populus nigra* ♀ with *P. pyramidalis* ♂ to give the original ♀ pyramidal poplar, and origin of the ♂ type as a heterozygous mutant, since propagated vegetatively. Some evidence from another source is presented for the occurrence of hybrids between *P. nigra* and *P. pyramidalis*.—R. E. Clausen.

1459. ORCUTT, MARION L. Hog-cholera bacilli. Jour. Exp. Med. 38: 9-15. 1923.—Much work has been done on mutation among various bacteria (cholera vibrios; typhoid, paratyphoid, hog-cholera, and dysentery bacteria, *Bacillus coli*, *B. enteritidis*, *B. alkaligenes*, *B. prodigiosus*, *B. pyocyaneus*, and streptococci) by different investigators. The present paper is confined to *B. suispestifer* in which the author observed a mutation from smooth to granular types (A = smooth and B = granular), and a mutant with a moist, opaque colony formation. The B mutant remains such when in pure culture. It assumes some A characteristics in rapid successive transplantings in bouillon and can usually be found in older transplants of A. The 2 types may be distinguished by certain cultural characters, by slightly different agglutination reactions, and by different degrees of virulence.—C. S. Hoar.

1460. OSTERHOUT, W. J. V. The nature of life. viii + 117 p. Henry Holt & Co.: New York, 1924.—The nature of life is discussed in non-technical language from the standpoint of origin, growth, reproduction, irritability, metabolism, electrical forces, and control. In the portion devoted to the control of life, the author briefly discusses the mechanistic viewpoint; the organism as a machine; the power of certain glands in determining morphological and physiological characteristics such as milk secretion, secondary sexual characters, etc.; the

effect of certain chemicals on development; the "chemical" fertilization experiments of Loeb; the lack of vitamin "x" in rat diet, resulting in sterility; the modifying effects of light, temperature, and moisture on characters; the artificial production of cancer by painting rabbits' ears with coal tar; the experiments of Pearl; Stockard and others on the effect of alcohol on the germ-cells; the inheritance of acquired characters and the experiments of Guyer and Smith, Griffith, Bentley and Detlefsen; the mutants of *Drosophila*.—*Orland E. White*.

1461. PAYNE, F. **Crossover modifiers in the third chromosome of *Drosophila melanogaster*.** *Genetics* 9: 327-342. 1 fig. 1924.—A review is given of the 3rd chromosome linkage modifiers previously reported. Analysis of the stock with lance wings, a variable character proved by cross to *SD* to have its gene or genes in the 2nd chromosome, shows that the stock contains in 1 of the 3rd chromosomes 2 crossover modifiers, *CIII<sup>PR</sup>* and *CIII<sup>PL</sup>*, each of which became associated with a lethal factor not present in the original stock. Modifier *lCIII<sup>PL</sup>*, in the region of hairy and scarlet, restricts crossing over in the left half. Modifier *lCIII<sup>PR</sup>*, in the region of ebony, restricts crossing over in the right half. Analysis is made by crossing to 2 stocks with the 3rd chromosome genes *r<sub>u</sub>h<sub>8</sub>p<sup>ps</sup>e<sup>\*</sup>*, called "*III<sup>ple</sup>*," and *e<sup>\*</sup>r<sub>ca</sub>*. High crossing over between *h* and *s<sub>1</sub>* obtained with *lCIII<sup>PR</sup>* is explained by modifier in "*III<sup>ple</sup>*." The second 3rd chromosome of lance carries a lethal balancing *lCIII<sup>PL</sup>* and *lCIII<sup>PR</sup>*. Reduction of *r<sub>u</sub>-h* value from 23.0 to 13.9 may be explained by a modifier in this chromosome or better by a modifier in the left end of the 3rd chromosome of "*III<sup>ple</sup>*." Tests by crossing lance as well as Muller's  $\frac{lCIII<sup>PL</sup>lCIII<sup>PR with *bp<sub>1</sub>cp<sub>2</sub>sp* showed *lCIII<sup>PL</sup>* and *lCIII<sup>PR</sup>* to have no effect on the 2nd chromosome, and tests with *w<sup>m</sup>* showed no effect on the 1st.—*P. W. Whiting*.</sup>$

1462. PELTIER, G. L. **Further studies on the susceptibility to citrus canker of different species and hybrids of the genus *Citrus*, including the wild relatives.** *Jour. Agric. Res.* 28: 227-239. 1924.—The writer summarizes in 3 tables the results of investigations from 1917 to 1921 on the relative susceptibility to citrus canker of wild relatives of the genus *Citrus*, of citrus fruits, and of citrus hybrids. The results of these investigations indicate that the best canker-resistant plants will come from the hybrids.—*Charlotte Elliott*.

1463. PLATH, O. E. **Breeding experiments with confined *Bremus* (*Bombus*) queens.** *Biol. Bull.* 45: 325-341. 1923.—A brief review of the work already done on the subject is given. The author found that a *B. bimaculatus* queen produced males exclusively which indicated that she had not been fertilized the preceding fall, a fact which previous investigators had failed to notice. His observations were conducted on *Bremus bimaculatus*, *B. impatiens*, *B. perplexus*, *B. ternarius*, *B. vagans auricomus*, *B. rufocinctus*, *B. separatus*, *B. fervidus* and *B. pennsylvanicus*. He developed a successful method of rearing colonies of these species in confinement and tested previous experiments, confirming some and refuting others.—*J. A. Munro*.

1464. PLOUGH, H. H., AND M. B. STRAUSS. **Experiments on toleration of temperature by *Drosophila*.** *Jour. Gen. Physiol.* 6: 167-176. 1923.—While most wild strains of *Drosophila melanogaster* will breed indefinitely on banana agar at 31°C., a single wild strain has been found which will not tolerate a temperature above 29°C. The ordinary stocks also failed to breed at temperatures above 29°C. It thus appears that genetic differences in ability to tolerate temperatures above 29°C. exist. That such genetic differences may be of importance in determining the range of a species is suggested by the further fact that stocks of *D. immigrans*, and *D. funebris* could not be bred above 29°C., and that these forms are not found in the tropics. The question of the reason for failure to breed is discussed.—*H. H. Plough*.

1465. Попова, Г [Ророва, G.] **Виды *Aegilops* и их массовая гибридизация с пшеницей в Туркестане.** [Wild species of *Aegilops* and their mass-hybridization with wheat in Turkestan.] *Труды по прикладной ботанике и селекции* [Bull. Applied Bot. and Plant Breeding] 13: 461-482. 1923.—The 1st part of the paper deals with the taxonomy of the varieties. The varieties could be broken up into still smaller units if variations in the length of the tooth of the empty glumes, their dentation and the length of the awn are considered. The varieties are all represented by a series of spring and winter forms. Comparison of the forms of *Triticum* and *Aegilops* shows a striking parallelism in the variability of these species. Both *Aegilops* and *Triticum* show varieties awned or awnless, smooth or hairy, with



white, red, or brown heads, etc. *Aegilops* like *Triticum* can be divided into hard and soft varieties. The 1st are little subject to rust and possess solid straw, the latter are affected by rust and their straw is hollow. The hard *Aegilops* varieties appear to cross more easily with hard wheats, while soft wheats cross more readily with soft *Aegilops* varieties. *Aegilops* and *Triticum* were observed to hybridize freely in Turkestan, but most hybrids were found to be sterile. Out of 300 plants 7 produced grains, 1 on each plant. Of these 7 grains, 4 did not germinate. Three seedlings developed. When mature, 2 of them looked like *Aegilops cylindrica*, the 3rd had retained the typical character of the hybrid. The most common natural hybrid seems to be a cross between *Aegilops cylindrica* Host and *Triticum vulgare* L. Another less common hybrid is probably a cross between *Aegilops crassa* Bois and *Triticum vulgare* L. The grains produced by the last hybrid did not germinate.—*Ernst Artschwager*.

1466. PRINGSHEIM, E. G. Physiologische Studien an Moosen, 2te Mitteilung: Die sterile und die fertile Form von *Leptobryum piriforme*. [Physiological studies on mosses, 2nd communication: the sterile and fertile forms of *Leptobryum piriforme*.] Jahrb. Wiss. Bot. 63: 159-171. 1924.—By spore cultures and regeneration of defoliated plants 3 further races of *L. piriforme* were isolated (see authors 1st communication Jahrb. 60. 1921). These races are more similar to each other than to the parent stock. The principal difference is that the new varieties can form reproductive organs which are always lacking in the original type. There are other minor differences but they are not sufficient to warrant the distinction of new forms or species.—*S. F. Cook*.

1467. PUNNETT, R. C. On the "Japanese" rabbit. Jour. Genetics 14: 231-240. 1924.—"Japanese" rabbits are characterized by a yellow ground with irregular patches of dark pigment which tend to be distributed over the hinder part of the body in transverse bands. Crosses with self colored animals showed the Japanese pattern recessive to self and the black of the dark bands replaceable by blue or chocolate. Back crosses showed that some of the Japanese were carrying agouti although all looked alike. The black proved to be a dominant black belonging to a series of 4 allelomorphs: dominant black, Japanese pattern, recessive black and tortoise.—*E. C. MacDowell*.

1468. REA, J. L. Our best blue flower. Larkspur in superlative strains from seed and cuttings. Blight-resistant plants through hybridizing. Garden Mag. 39: 407-408. 1924.—The best way to obtain a distinctive and satisfactory collection of Delphiniums is to grow seedlings from 4 or 5 of the best seed strains, select the best for planting and increase the stock through cuttings and further seed sowing. Fungicides for prevention of blight are discussed as well as hybridizing for the development of a resistant strain.—*Charlotte Elliott*.

1469. REDFIELD, CASPAR L. Testing Lamarck's theory. Illinois Acad. Sci. Trans. 16: 145-153. 1923.—Lamarck's theory of inheritance of acquired characters has been misunderstood for many years. He states definitely that he did not believe mutilations or accidental injuries were inherited. Also, he did not claim that environment caused change. Animals lived in the environment and the environment directed the actions of animals but did not of itself produce a change. The author states the 2 fundamental laws of Lamarck's theory of inheritance of acquired characters and discusses their meaning. He illustrates the points in this law by a discussion of the American trotter, showing that frequent and continuous exercise over an unusual length of time causes modifications within the animal which are capable of being inherited.—*H. W. Anderson*.

1470. RHODES, A. S. Apple measles, with special reference to the comparative susceptibility and resistance of apple varieties to this disease in Missouri. Phytopathology 14: 289-314. 1924.—The literature on a bark disease of apples known as measles is reviewed and discussed. Illustrations and descriptions of the macroscopic and microscopic characters of the disease are given. The results of the writer's observations on the comparative susceptibility and resistance of apple varieties to measles in Missouri are given in tabular form. The trouble appears to be purely physiological and not of any great consequence as far as the health of the tree is concerned.—*Charlotte Elliott*.

1471. SASAKI, TAKASHI. Inheritance of eye and flower-color in the cowpea. (Japanese.) Jour. Sci. Agric. Soc. 232: 19-38. 2 fig. 1922.—Crosses of different races of the cowpea (*Vigna Catjang* var. *sinensis*) were made to study the genetical behavior of the eye and flower colors

as well as the correlation between them. A new kind of eye was found in seed of the 2 races called "Yakko" No. 1 and No. 2, in which the pigmented area is larger than in the large eye, but much smaller than in the Holstein. The cross between "Yakko" and some races with solid-colored seed indicates that a factor is responsible for changing this eye into solid, which the author calls *Z* factor. The latter is also able to convert white flowers with faintly tinged wings into reddish violet ones; it resembles very much the so-called Watson factor of Spillman. Crosses were made between "Yakko" No. 1 and "Shiro" distinguished by white flowers, colorless seeds, no pigmentation at the stem nodes, extremities of leaf-stalk, or at the junction of pinnae with stalk. These experiments have shown that all characters of "Shiro" above mentioned are always linked together in accordance with Spillman's view and contrary to that of Harland.—In a cross of a race possessing the so-called small eye pattern with a certain solid-seeded race, the author has found in  $F_2$ , besides several forms of eye already described by Spillman, that is, Watson pattern and many types of eyes varying from small eye to pure Holstein, also the eye of "Yakko" No. 1. These facts led the author to conclude that 2 independent pairs of factors are involved in the pure Holstein, each of which acts differently by itself. Harland assumes 2 factors  $H_1$  and  $H_2$ , concerning the Holstein pattern, each of which is able to produce the Holstein type, and consequently should act in the same way, as Spillman's *H* factor. Harland's hypothesis, therefore, differs from the author's. Further, the author suggests the 3-factors-hypothesis to explain his results from several crosses between solid-seeded races and eye-seeded races instead of the 2 factors proposed by Spillman.—*Author.* (*Courtesy Japanese Jour. Bot.*)

1472. SCOTT, D. H. The present position of the theory of descent, in relation to the early history of plants. Rept. Brit. Assoc. Adv. Sci. 89: 170–186. 1921 [1922].—We know astonishingly little about variation. Organisms should be thought of as representatives of races not as isolated individuals. Palaeontologists have learned greater caution particularly in avoiding elaborate derivations of 1 type of structure from another where the supposed transitional forms have but a subjective existence. Recent investigation of earlier Devonian flora show stems of gymnosperms but no true ferns, so the idea that gymnosperms were derived from pteridophytes should perhaps be abandoned. Both may have descended from distinct but related algae. Simple land plants like *Rhynia* and *Hornea* differ chiefly from algae in having water conducting tissue and stomata and manifestly air borne spores.—*Ansel F. Hemenway.*

1473. SIMON, S. V. Über eine spontan entstandene Blütenvergrünung von *Torenia* und das genetische Verhalten ihrer Nachkommenschaft. [Spontaneous origin of green flowers in *Torenia* and the genetic behavior of its descendants.] Jahrb. Wiss. Bot. 63: 172–230. 1924.—The great variability of the teratological appearance, "green flowers," and its dependence on environment are shown. The extreme consists in a suppression of floral parts which are replaced by innumerable buds; all transition stages are found up to a condition scarcely different from normal. Great plasticity is shown by strains in the effect of environment. The appearance of "green flowers" is brought about under conditions generally unfavorable to growth. The inheritance of the condition indicates that it is due to a factorial mutation. Its appearance in  $F_1$  indicates the probability of homozygosity of a conditioning gene in the parent plant. A graded series in respect to appearance indicates a close connection with other hereditary factors determining blossom form. Another possible interpretation is that the parent form showed a mutation and the progeny another in the same direction but of different degree. Possibly this mutant was determined by 2 changes in the germinal constitution, a change in the blossom gene, and the origin of a gene for the teratological "green flower." Other suggestions include multiple allelomorphism, and incomplete linkage. The occurrence of a "brevistylous" mutant is thought to involve mutation of a gene complex.—*Helen Deuss Hill.*

1474. SLATE, W. L., JR. Report of the director for the year ending October 31, 1923. Connecticut Agric. Exp. Sta. Bull. 254. 154–156. 1923 [1924].—Methods of crossing and selection are being employed to improve double-crossed Burr-Leaming; dent and flint corns; and also Evergreen and Golden Bantam sweet corn for canning purposes. The method of "selection in self-fertilized lines" is being applied in a primary way to produce a long-lived, winter-hardy alfalfa and a clover resistant to mildew. Technical studies are confined to the inheritance of disease resistance and of abnormalities, with particular regard to sterility; the



obtaining of complete homozygosity in a naturally cross-fertilized species; and the linkage of hereditary factors. Breeding work with tobacco is being carried on at the Tobacco Sub-Station.—*Dorothy I. Neff.*

1475. SÔ, MASAO. On the inheritance of variegation in barley. (Japanese.) *Idengaku-Zasshi* [Japanese Jour. Genetics] 1: 21-36. 1921.

1476. SPINKS, G. T. Notes on strawberry breeding. *Jour. Bath & W. and S. Counties Soc. Agric.* 18: 238-247. 1924.—The results obtained from many strawberry crosses are reported. The characters noted are productiveness, earliness, lateness, size, color, shape, texture, flavor, foliage, vigor and disease resistance. The number of seedlings selected from 6 of the crosses for further test is given.—*Richard Wellington.*

1477. STANGEL, W. L. A fertile mare mule. *Breeder's Gaz.* 85: 77. 1 fig. 1924.—The Texas Agric. College obtained from L. T. Branham, Montalba, Texas, on August 11, 1921 a mare mule and her foal by a jack. She was bred immediately to a jack but failed to foal in 1922. She was bred to a saddle stallion October 25, 1922, and on September 26, 1923, foaled a living stallion colt. The facts as stated are vouched for by the members of the College staff of the Texas Agric. College. If this ♀ is a mule and not a jennet it is the 1st authentic record of a mare mule foaling living foals.—*W. S. Anderson.*

1478. STROMAN, G. N. Genetic relations of chlorophyll and anthocyanin seedling characters in maize. *Genetics* 9: 91-123. 1924.—The factors *Pl* for plant color and *W<sub>1</sub>* for albino seedlings were found to be linked with a crossover value of 25% while the factor *Y* was found to be linked with *W<sub>1</sub>* with a crossover value of 42%, the arrangement being *Y-Pl-W<sub>1</sub>*.—The *Aa* factor pair for aleurone, and plant color was found to be loosely linked with the *V<sub>1</sub>v<sub>1</sub>* factor pair for green-virescent seedlings with a 45% crossover.—A linkage is reported also for a factor pair for albino seedlings *W<sub>2</sub>* with a factor causing red and non-red stem seedlings (*r<sup>o</sup> ?*) with a 17% crossover.—*J. H. Kempton.*

1479. STRONG, L. C. A genetic analysis of the factors underlying susceptibility to transplantable tumors. *Jour. Exp. Zool.* 36: 67-134. 1 pl., 32 fig. 1922.—The author reviews certain of the contributions to the genetics of cancer; factors underlying susceptibility to transplantable tumor tissue, and prevalent conceptions concerning peculiarities and characteristics of the tumor cell. The conclusions are grouped under the 2 headings: Activity of tumor cell; and reaction of host.—(1) Activity of tumor cell: No rhythms of tumor growth were encountered, there being uniform reaction, in some cases at least, providing the tumor had been transplanted into individuals of the same age and sex of a relatively homogeneous series of hosts. A transplanted tumor grows progressively (within limits) at a fairly uniform rate of development if placed in mice definitely proved homogeneous. Sudden fluctuations in growth may occur sporadically, due possibly to a process analogous to mutation.—(2) Reaction of host: Race is a primary factor which determines whether or not a given individual shall or shall not grow the tumor-mass progressively. Susceptibility and non-susceptibility are manifestations of the genetic constitution of the individual. Several secondary physiological factors, such as age, may be contributory or accessory factors. The age factor is an expression of the degree of the process of assumption of tissue specificity, controlled to some extent by the activities of the gonads. The age susceptibility curve of transplantable tumors for normal individuals is shown to be remarkably similar to the curve of activity of the gonads. The sex factor depends on the age factor, and on the difference in metabolic activity between the sexes at different age periods. Removal of gonads does not change massed percentage reactions for individuals of a non-susceptible race. The author points out that this bears out the previous conclusion that the number of percentage reactions in a given strain depends on the genetic constitution of the individuals. Gonadectomy, in the stock employed in these experiments, produces a significant increase in percentage reaction in mice attaining sexual maturity, seeming to produce a "neutral" type. It also can interfere with the individuality of the tissues, and the normal functioning of the age factor. In some cases, a severe shock, such as that caused by the operation for gonadectomy, may produce a state resistant to transplantable tumors, which is at its maximum from 5 to 10 days after the operation.—*E. E. Jones.*

1480. SUMNER, F. B. Results of experiments in hybridizing subspecies of *Peromyscus*.

Jour. Exp. Zool. 38: 245-292. 7 fig. 1923.—A statistical study is given of 3 series of subspecific crosses based on the following numbers of animals: pure races, 116, 121, 140, 146;  $F_1$ , 154, 97, 59;  $F_2$ , 84, 87, 66. Nineteen characters were measured including 5 that deal with the amount of pigmentation. Four tables give means, standard deviations with their probable errors, and parent-offspring and fraternal correlation coefficients for certain characters. Mean values are usually between parental values, although in some cases one parental value may be reached or even surpassed.  $F_1$  and  $F_2$  usually give means close together, with the  $F_1$  tending to be higher. Mendelian dominance has not been found in any case. The  $F_2$  shows greater variability than the  $F_1$ . This is as true for characters in which the parent races do not differ as for those in which the difference is great; the non-hereditary right-left ratios of paired bones consistently show this increased variability in  $F_2$ . Correlation coefficients for pure parent by  $F_1$  offspring for all crosses average +0.243; for  $F_1$  parents by  $F_2$  offspring the correlation is +0.306. Fraternal correlations in  $F_1$  and  $F_2$  do not differ significantly. The characters in a subspecific complex show no clear tendency to segregate together after a cross. The discussion emphasizes the inconsistency in results with a multiple factor interpretation and the origin of subspecies by such a process of "mutation" as studied in *Drosophila* is doubted.—E. C. MacDowell.

1481. SUMNER, F. B., AND H. H. COLLINS. Further studies of color mutations in mice of the genus *Peromyscus*. Jour. Exp. Zool. 36: 289-321. 2 col. pl. 1922.—Six appearances are recorded of the mutation yellow from different families of *Peromyscus maniculatus gambeli*, all originally collected in the same general locality. Two of these gave rise to strains which showed characteristic differences in color, as well as great variation between individuals. A mutation called "pallid" appeared in  $F_2$  of a cross between 2 subspecies of the same genus; black pigment was greatly reduced, and eyes were dark red and less protruding than in the wild forms. Albinism appeared but once. All types are described in terms of colorimetric readings. The 3 colors are recessive to wild type. Segregation of the pallids and albinos is sharp, while yellows segregate with confusing intermediates. The genes for albinism and pallid are closely linked. The relation of these types to colors found in the house mouse are discussed.—E. C. MacDowell.

1482. SUZUTA, IWAQ, AND TYUHEI TOMURA. Natural hybrids in lowland rice. Landw. Mitteil. Formosa 184: 1-27. 1922.—A number of varieties of lowland rice cultivated in Taiwan were studied. In about 81, 78, and 29%, respectively, of the plants in 3 plats, anther opening and pollen liberation accompanied opening of the glumes, with consequent self-pollination. In the plat with 29% of coincidence, anthers in 55% of the individuals began to burst 10 seconds after the glumes opened, indicating the probability of occasional open or foreign pollination. When a strain characterized by a purple coloring of leaf veins and auricles, upper sections of nodes, glume beaks, and stigmas, was planted, under various conditions of adjacency to a variety from green to white in color, 0.9-1.45% of hybrids resulted. The percentage of vicinists increased as the plants were closer together. Where these strains were planted parallel, 0.47% of hybrids were found in the leeward plat and only 0.086% in the windward.—From author's abstract. (Courtesy Japanese Jour. Bot.)

1483. TERAQ, HIROSI. Mutation and inheritance of semi-sterility in the rice-plant. (Japanese.) Idengaku Zasshi [Japanese Jour. Genetics] 1: 45-54. 1921.—The author has found in certain pedigree strains of the rice-plant which had been otherwise constantly fertile, a type of semi-sterile plant; in which about  $\frac{1}{2}$  of the total spikelets are barren. Two families, each being derived from a single parent, contained 1 semi-sterile for 117 and 114 fertiles, respectively. The mode of inheritance of semi-sterility is as follows: Each semi-sterile plant segregates into fertiles and semi-steriles, the former breeding true and the latter repeating the same mode of segregation in later generations. In his experiment on 129 segregating families the author has found in total 3923 fertiles (50.91%), and 3783 semi-steriles (49.09%), and he thinks that the segregation ratio is to be regarded as 1:1. The hereditary behavior of semi-sterility just described may be explained as follows: Semi-sterility is due to a sex-linked lethal factor *a* causing the death of the female gametes, but not affecting the male, and its allelomorph *A* which behaves quite normally. The zygote *Aa* produces consequently both *A* and *a* male gametes, but simply *A* female, so that only 2 kinds of offspring *AA* and *Aa* are



produced in the ratio 1:1. The original production of semi-sterile plants may be attributed to the mutation of the allelomorph *A* in the original fertile zygote *AA* into *a*. Such mutation might be supposed to have occurred in the gametes, but since, then, the number of the gametes containing *a* should be exceedingly small as compared to that of those containing *A*, there is very little probability of the production of semi-sterile plants. The better hypothesis would be that the mutation has taken place in vegetative cells, giving rise to a sectant composed of *Aa* cells, through which the semi-sterile progeny of *Aa* composition have been produced. The author refers also to the case of semi-sterility of hybrid beans studied by Belling, and he thinks that the hypothesis of the latter author for explaining the phenomenon is hardly applicable to his own case.—*Author*. (*Courtesy Japanese Jour. Bot.*)

1484. TERA0, HIROSI. On mutation in the "large-grained" rice, especially regarding the frequency of allelomorphic transformation. (Japanese.) *Idengaku Zassi* (Japanese Jour. Genetics) 1: 127-151. 4 fig. 1922.—The "large-grained" rice is supposed to be a mutant derived from a certain variety of the normal type and so contrasted to the latter that (1) the spikelets and seed of the large-grained rice are distinctly of larger size than those of the normal, and that (2) the panicles of the large-grained bear a much smaller number of spikelets than the normal, spikelets being generally absent on secondary branchlets of the panicle. In any other character these 2 types show no difference. There appears also no indication of sterility in the spikelets borne on the large-grained panicles.—A special case of mutation occurring in the large-grained rice has been studied with regard to the nature and frequency of the mutation. The results are summarized as follows: (1) Although the large-grained plant breeds essentially true to type it produces regularly a few normal plants (in an experiment 140 or 5.31% normals among 2635 plants raised from 51 large-grained parents). The occurrence of these normals should be attributed to mutations since they recur always even when the parent plants are protected artificially from natural cross-pollination. (2) The normal plants give rise in the next generation to 2 types of families, 1 with normals only the other segregating into normal and large-grained; the segregating families predominate in number over the uniformly normal ones (4 uniformly normals to 20 segregatings). The proportions of normal plants and large-grained in the segregating families deviate from the ordinary 3:1 ratio showing some excess of the dominant, or normal type (545, 21.96%, large-grained among 2482 plants in the 20 segregating families). (3) The normal plants of segregating families produce again uniformly normal families and segregating ones, the former exceeding in number the theoretical proportion for the 1:2 ratio (52, 38.52%, uniformly normals among 135 families in total). The proportions of normal and large-grained in segregating families show here again some excess of normals over the theoretical proportion for the 3:1 ratio (1682, 22.58%, large-grained among 7453 plants in the 83 segregating families); in the group of these 83 segregating families the frequency distribution of the deviations of segregation ratios in terms of probable errors fits very closely the theoretical frequency distribution, provided that the true percentage of the recessive type is assumed arbitrarily as 22.5% ( $P = 0.96$ ). (4) Larger or smaller sectants with normal grains appear on otherwise large-grained plants very regularly, resulting in mosaic forms of various types, for example, panicles in which one or more branches are normal and the remaining parts are all large-grained, and panicles which are normal on one side of the axis and large-grained on the opposite, and further plants in which one or more panicles are entirely normal while the others are large-grained, the sizes of such normal sectants are regarded as exhibiting a range of continuous variations. Mosaic forms with smaller normal sectants occur much more frequently than those with larger normal ones; entirely normal panicles occurring in otherwise large-grained plants amounted to 68 (6.63%) among 10,264 panicles when the plants were taken at random, and 18 (1.79%) among 10,074 panicles when those plants which bore more than one normal panicle were eliminated. (5) The normal sectants of mosaic forms always produce segregating families similar to those noted above. The phenomena described belong to the same type as the mutations in the sterile rice studied before by the author (*American Naturalist* 51: 690-698, 1917) and are explained in a similar way. The explanation follows:—While the large-grained type is inherited as a mono-hybrid recessive character to normal, the recessive allelomorph for the former (*a*) is occasionally transformed by mutation into the dominant allelomorph for the latter (*A*); such allelomorphic transformation takes place

in cells of meristematic tissue probably during cell-division and independently in each allelomorph. As a consequence, there will be originated in the recessive homozygote ( $aa$ ) large-grained plant heterozygotic cells ( $Aa$ ) which will afterwards through cell multiplications form heterozygotic normal sectants; this accounts for the fact already mentioned that the normal sectants of mosaic forms give rise to segregating progeny. This same vegetative mutation must also be the cause by which normal mutants occur in the progeny of the plants that were taken as entirely large-grained. When the heterozygotic normal sectants are so small that they may not readily be distinguished as such, the seed borne on these sectants will, on sowing, be mixed with those on the large-grained parts, and consequently the normal plants produced by segregation from the heterozygotic sectants will appear to have originated from absolutely large-grained plants by mutations occurring either in generative cells or during fertilization. Such an inference accords also with the facts that the mutants which would have been caused by allelomorphic changes in generative cells or during fertilization should very largely be heterozygotes, and that among the mutants of this kind so many dominant homozygotes as observed in the present experiment can never be expected. In a similar way to that in the recessive homozygotes, the heterozygotes ( $Aa$ ) as well as the heterozygotic sectants of mosaic forms may in their turn produce dominant homozygotic sectants ( $AA$ ); the latter, while they do not show any visible sign to be distinguished from the heterozygotic parts, will give rise to dominant homozygotes exclusively; consequently in the progeny of such parents there will be presented the aberrant segregation ratios  $D:R=3+p:1-p$  and  $AA:Aa=1+q:2-q$  ( $0 < p < 1$ , and  $0 < q < 2$ ), such as seen in this experiment. Further, the allelomorphic transformation under consideration is supposed to occur in dividing cells of any part of the plant body, because the normal sectant of a mosaic form appears in any size. Again, the probability of the allelomorphic transformation is regarded as always fixed because all the phenomena of mutation and inheritance observed in the experiment are apparently of definite numerical relations. Finally, such mutability being presumed to be a characteristic trait of the recessive allelomorph concerned, it may not be impossible that not only vegetative (diploid) cells, but also generative (haploid) cells are affected by the mutative transformation of the recessive allelomorph and probably with the same frequency. From these assumptions, the author establishes theoretical formulas which express the quantitative relations of the mutations and inheritance under discussion in terms of probability ( $x$ ) of the allelomorphic transformations. Substituting for  $x$  in these formulas various values taken arbitrarily, and comparing the calculated numerical relations to these observed, he has found that if  $x=0.01$  the figures from these 2 different sources fit each other very closely. The mutation in the sterile rice referred to before is regarded as being similar to the present case.—*Author.* (Courtesy *Japanese Jour. Bot.*)

1485. THOMPSON, W. P. Lethal factors in cereals. *Western Canadian Soc. Agron. Proc.* 3: 53-59. 2 fig. 1922.—In 2 studies of dwarfness in wheat [*T. sativum*] it was concluded that dwarfness is dominant and that homozygous dwarfs carry a strictly lethal character, affecting also heterozygotes in part. An explanation upon a Mendelian basis, in at least 1 of the cases, assumes a complex genotype. Tentative counts from root tips indicated about 20 chromosomes instead of the expected 42.—A single rye plant had branched heads, similar to *Triticum compositum*, and produced but 1 (similar) offspring from 125 seed. The line died out when 43 seed from this plant failed to grow.—*L. R. Waldron.*

1486. TRABUT, L. Mutations par bourgeons chez les citrus. [Bud mutation in the citrus.] *Bull. Agric. Algérie, Tunisie, Maroc* 2nd Ser. 30: 3-10. 1924.—Bud mutations in the genus *Citrus* occur frequently. These mutations may produce new and interesting varieties worth preserving, such as the navel orange, or the fruit may be inferior or worthless. Since navel oranges have stamens without pollen, the occasional seed which develop are due to foreign pollen as are also the abnormalities of skin color and texture. These abnormal characters of certain citrus fruit are classed as carpoxenies and the writer concludes that dormant buds near these fruits may also be subject to the influence of foreign pollen. This cladoxenie he considers as the origin of part of the bud mutations, and concludes that horticulturists can readily bring about bud mutation.—*Charlotte Elliott.*

1487. TURNER, C. L. The Psychodidae (moth-like flies) as subjects for studies in breed-



ing and heredity. Amer. Nat. 57: 545-558. 1923.—The author gives the 1st of an intended series of articles on the Psychodidae as subjects for studies in breeding and heredity. These flies have the requisites of suitable breeding animals: They are common forms of rather small size, they are easily reared in natural media, the life cycle is extremely short, and *Psychoda alternata* has already given rise to a white-eyed mutation. Reference is made to the literature on the life history, habits and structural characters of the Psychodidae. The life history and external structure of *Psychoda alternata* and *Psychoda minuta* are given. Culture methods, including the media used, moisture and temperature, culture vessels, and methods of isolating and transplanting specimens are discussed.—*Grace Sandhouse.*

1488. WALDRON, L. R. A study of dwarfness in wheat accompanied by unexpected ratios. Genetics 9: 212-246. 2 fig. 1924.—When 2 common wheats, Marquis and Kota, were crossed, dwarfs averaging 26 cm. in height were produced in the F<sub>2</sub> generation in the ratio of approximately 55 normals: 9 dwarfs. In the 2 succeeding generations the ratios 1:0, 3:1, 13:3, 55:9, 1:3, 7:9, and 0:1 were obtained, which would be in accordance with a genotype having 1 factor for normal height, dominant, with 2 factors for dwarfness necessarily acting together to produce the dwarf plant, in the absence of *N*. Aside from these noted above, ratios of 15:1, 63:1, 1:15, and 1:63 were secured. It is suggested that factor modification may take place sufficiently to explain the unexpected ratios. A suggested method of crossing for testing out the hypothesis is outlined.—*Author.*

1489. WATKINS, A. E. Genetic and cytological studies in wheat. I. Jour. Genetics 14: 129-171. 77 fig. 1924.—A cross was made between *Triticum turgidum* (28 chromosomes) and *T. vulgare* (42 chromosomes). A detailed study was made of 1 plant with 14 bivalent and 3 univalent chromosomes and of 1 with 17 bivalents and 4 univalents. The univalents lag behind the bivalent members; the latter move toward the poles at the close of the heterotypic metaphase. Before moving poleward the univalents show a longitudinal split but occasionally an unsplit univalent may be caught in the newly formed haploid nucleus before it has moved to the equatorial plate. The lagging univalents complete their split and travel to opposite poles which may be reached too late for their inclusion in the new nuclei. In the homotypic division the univalents, which this time do not split, again lag behind the bivalent offspring members and often 1 or more are not included in the new nuclei. It was found possible to count lost univalents at different stages, from a considerable number of cells. From the observations, basing the behavior of the univalents on chance, and from deductions therefrom, equations (mainly from binomial expansions) were developed dealing (1) with loss of univalent chromosomes from heterotype divisions, (2) re-inclusion of such once lost chromosomes in the homotype division, (3) their loss in the homotype division, (4) their random segregation in the homotype, (5) frequencies of the gametic classes, and (6) chromosome composition of the population resulting from gametic classes given in (5). In the foregoing it was assumed that ♂ and ♀ gametic populations are identical and that random mating is the rule. It is shown also that random segregation of the univalents at the heterotype followed by their longitudinal splitting and poleward movement at the homotype without loss, will not alter the frequencies of the microspore classes. The question of sterility, briefly discussed, is reserved for a later paper.—*L. R. Waldron.*

1490. WEIDENREICH, FRANZ. Die Zygodactylie und ihre Vererbung. [Zygodactyly and its inheritance.] Zeitschr. Indukt. Abstamm.- u. Vererb. 32: 304-311. 1923.—This is a general discussion of syndactyly in men given with the purpose of stimulating the collection of data on that question. The name zygodactyly is applied to syndactyly between the 2nd and 3rd toe, which is the most frequent case of syndactyly observed. On the hand, syndactyly of 3rd and 4th finger is most frequent. The belief is expressed that zygodactyly is correlated with syndactyly of the hand. The author thinks that zygodactyly is inherited but that the data collected up to this time indicate that it does not follow Mendelian laws.—*M. Demerec.*

1491. WERKENTHIN, FRED C. The founders of the art of plant breeding. Proc. Iowa Acad. Sci. 29: 291-310. 1922 [1924].—This is a brief record of the work of plant breeders from Camerer to Johannsen.—*H. S. Conard.*

1492. WIGGAM, ALBERT E. The new decalogue of science. 303 p. The Bobbs-Merrill Co.: Indianapolis. 1923.—This is a popular work in which the author considers various

phases of scientific research, especially the problems involving genetics, eugenics and evolution from the standpoint of their application to the present day world. The book is addressed to the newer type of statesman in the form of 5 warnings and 10 commandments based on the facts and teachings of modern science. The introductory chapter is "The ethical challenge" or "The new biology and the old statesmanship." The chapter headings of the 5 warnings are: (1) That the advanced races are going backward; (2) that heredity is the chief maker of men; (3) that the golden rule without science will wreck the race that tries it; (4) that medicine, hygiene and sanitation will weaken the human race; (5) that morals, education, art and religion will not improve the human race. Following the 5 warnings is a chapter headed "The ethical transition" or "The new Mount Sinai—the laboratory." The 10 commandments of science explain and discuss the duty of (1) eugenics, (2) scientific research, (3) the socialization of science, (4) measuring men, (5) humanizing industry, (6) preferential reproduction, (7) trusting intelligence, (8) art, (9) internationalism, (10) philosophical reconstruction. "The ethical outlook," or "The mental habits for a new approach" is the title of the final chapter.—*Orland E. White.*

1493. WOLFE, T. K. A biometrical analysis of characters of maize and of their inheritance. Virginia Agric. Exp. Sta. Tech. Bull. 26. 1-70. 1924.—This paper is divided into 3 parts, the 1st part being devoted to a biometrical analysis of 11 high yielding and 15 low yielding strains of Boone County White maize. Seven ear characters and 6 plant characters were considered, with the result that certain characters of the corn plant were found to be closely correlated while others showed little if any correlation. The differences between the coefficients for the years 1918 and 1919 were noted and the curve types for the characters under observation were determined.—The conclusion was reached that high or low yielding strains of corn can not be distinguished by the use of the score card; that there are indications that the score card may be of value in selecting high yielding ears within strains.—In Part II the inheritance of certain characters of maize as influenced by hybridization is discussed. Two hybrids were used, Alvord's Dent  $\times$  Conell no. 12 and Narrow Leaf (pop)  $\times$  Conell no. 12.—In Part III entitled "The inheritance of correlated characters," the correlation of stalk circumference with subsequent yield in the Silver King variety is studied and the conclusion reached that seed from stalks of large circumference are no better than ordinary field selected seed and that seed from stalks of small circumference are neither inferior nor superior to ordinary field selected seed.—*J. H. Kempton.*

1494. WOLFF, M. Einige Bemerkungen zur Bewertung der Descendenz-Hypothese und neuerer Hypothesen der Physik. [Evaluation of the hypothesis of descent and recent hypotheses of physics.] Arch. Naturgesch. Abt. A 88: 113-121. 1922.—The uselessness of the discussion of theories of descent and the impossibility of objective knowledge in this field are emphasized, as is also the lack of any sound metaphysical basis for modern theories of atomic structure and of relativity.—*C. E. Allen.*

1495. WOODWORTH, C. M. A program of corn improvement. Illinois Agric. Exp. Sta. Circ. 284. 1-24. 12 fig. 1924.—This is a popular discussion of methods for improvement of maize with emphasis on the eventual use of the pure line method. This circular is essentially a reprint of certain sections of Illinois Agric. Exp. Sta. Bull. 255 entitled "Corn root, stalk and ear rot diseases and their control through seed selection and breeding" by JAMES R. HOLBERT, W. L. BURLISON, BENJAMIN KOEHLER, C. M. WOODWORTH and GEORGE H. DUNGAN.—*J. H. Kempton.*

1496. YASU, KONO. On the behavior of chromosomes in the meiotic phase of some artificially raised *Papaver* hybrids. Bot. Mag. Tôkyô 35: 154-168. 1 pl., 1 fig. 1921.—The results of the author's investigation may be summarized as follows: Hybrids between a few species of *Papaver* were raised; the hybrid between *P. somniferum* and *P. orientale* is treated in some detail, especially in its cytological relations.—The general characters of  $F_1$  plants between *P. somniferum* and *P. orientale* mostly resemble the latter, the male parent, but many pollen grains are sterile.—In the meiotic prophase of the hybrid, the chromosomes unite end to end.—The hybrid plants between *P. somniferum* with 11 haploid chromosomes and *P. orientale* with 21 haploid chromosomes, form in the 1st meiotic division 11 bivalent chromosomes and 10 univalent chromosomes. All bivalent chromosomes form the equatorial plate 1st; they



may pass to the anaphase simultaneously, 7 of them 1st and the remaining 4 afterwards. As the bivalent chromosomes pass to the anaphase, the univalent chromosomes move to the equator in place of the latter. They split longitudinally, and the 2 halves separate to the opposite poles.—In the 2nd meiotic division the large chromosomes or the halves of the bivalent chromosomes form the equatorial plate earlier than the univalent non-dividing chromosomes.—Some chromosomes left outside the spindle either remain isolated in the cytoplasm or form miniature nuclei.—Two main nuclei connected by isolated chromosomes lying between the 2, become rounded and form a single diploid nucleus, the final result being the origin of a diploid pollen grain.—The irregular behavior of chromosomes in the meiotic division causes not only the union of 2 nuclei, but also the dropping of 1 or more chromosomes resulting in abnormalities of pollen grains. This may contribute to the origin of variations or new forms among the viable offspring on the one hand, and most probably induces the sterility or lethal condition of the male gametophyte on the other.—Further investigations are in progress. [See also following entry.]—*Author.* (*Courtesy Japanese Jour. Bot.*)

1497. YASUI, KONO. On the behavior of chromosomes in the meiotic phase of some artificially raised *Papaver* hybrids. (Japanese.) *Bot. Mag. Tôkyô* 35: (167)–(178). 1921.—This is a Japanese translation of the preceding Entry.—*S. Ikeno.* (*Courtesy Japanese Jour. Bot.*)

1498. ЗАВАДОВСКИЙ, М. М. [ZAVADOVSKI, M. M.] Пол и развитие его признаков. [Sex and the development of sex characters.] 255 p. 20 col. pl., 94 fig. Publisher not named: Moscow, 1922.—The paper deals with a study of the importance of sex hormones in the process of morphogenesis and the question of hybridization. There appears to be a striking parallelism if we analyze morphogenesis and hybridisation. Behind the symbols of the sex genes  $F$  and  $f$ , the sex hormones for femaleness and maleness may be sought. *Morphogenesis:* (1) The sum of the sex characters is in morphogenic dependence on the sex hormones. (2) In birds the hen is bisexual while the male bird is monosexual. (3) Femaleness hinders the development of masculine characters. (4) Femaleness and maleness are apparently identical in different birds. (5) In one and the same race, the soma of the male is equipotential to the soma of the female.  $X = X_1$ . The soma of the male is affected by the hormone  $M$ , that of the female by the hormone  $F$ .  $X + M \rightarrow \sigma$ .  $X + F (M) \rightarrow \varphi$ . (6) The soma of the male of 1 race is not identical with the soma of the female of another race; that is:  $X \neq X_1$ .—*Hybridization:* (1) The sum of the sex character can be expressed with a symbol  $F - \varphi$  and  $f$  or  $M - \sigma$ . (2) One of the sexes is heterozygous ( $Ff$ ), the other is homozygous ( $ff$ ). The female is heterozygous in case of the chicken. (3) The sex gene of the female ( $F$ ) is epistatic compared to the sex gene of the male ( $f$ ). (4) In race hybridization the sex genes of the different races are expressed by the same symbol.  $F = F_1 = F_2 \dots f = f_1 = f_2 \dots$  (5) In crossing male and female of the same race it is not necessary to express the secondary sex characters of male and female with special symbols. (6) In crossing male and female of different races, the secondary sex characters are expressed in special symbols. Morphogenesis provides a solid foundation for the symbols in genetics and makes it possible to guide and critically study the genetic analysis. It appears that we are nearing the solution of the sex problem.—*Ernst Artschwager.*

## HORTICULTURE

F. C. BRADFORD, *Editor*

(See also in this issue Entries 1073, 1134, 1138, 1159, 1211, 1338, 1384, 1436, 1462, 1468, 1486, 1688, 1697, 1709, 1722, 1723, 1739, 1740, 1771, 1777, 1822, 1843, 1947, 2103)

1499. ANONYMOUS. Bureau trials with green peas. *Agric. Gaz. New South Wales* 35: 656. 1924.—The variety Greenfeast gave the highest yields. The application of superphosphate at time of seeding gave better results than later applications.—*L. R. Waldron.*

1500. ANONYMOUS. Economic plants of South Africa. Notes from the National Herbarium and Museum. II. "*Bauhinia esculenta*" Burch. *Jour. Dept. Agric. Union South Africa* 8: 613–615. 1924.—*Bauhinia esculenta* Burch. is commonly called "Tamani Berry" or "Gems-bok bean." It has been recorded from South West Africa, Bechuanaland, and in the South

Western Transvaal where it grows very freely. The seed form the staple diet of the Kalahari Bushmen, and animals eat it readily; it is especially good as a fattening mixture. Analyses are given of the bean, the oil which is extracted from the seed, and the bean meal left after extraction of oil from the kernels, and these figures are compared with those for cotton seed oil.—The kernels are rich in protein and oil, the latter resembling cotton seed oil to which it might prove superior for edible use. The meal is superior to decorticated cotton seed cake.—*L. I. Goldblatt.*

1501. ANDERSON, F. U. **Progress in bud selection.** *Nation Nurseryman* 32<sup>o</sup>: 234. 1924.—The Nurserymen's Bud Selection Assoc. of California have authorized the sale of selected buds to all nurserymen and fruit growers, and the certification of nursery trees by means of a permanent seal attached to each tree. This movement is expected to insure varieties true to name and to secure trees from superior trees when possible.—*J. H. Gourley.*

1502. APPLEMAN, C. O. **Forecasting the date and duration of the best canning stage for sweet corn.** *Maryland Agric. Exp. Sta. Bull.* 254. 47-56. 1923.—High sugar content is of 1st importance in determining the most desirable quality of sweet corn for canning, but the percentage of starch also must be sufficiently high to give body to the corn. Since starch increases as sugar decreases, the most desirable stage for canning would seem to be a compromise between sugar content and other constituents. As a basis for predictions, the best canning stage is taken to be 5-6% sugar and 10-11% starch.—From the beginning of kernel formation until the end of the ripening period sugar moves from the plant into the kernels, where it is transformed to starch. Rate of starch formation seems to be the controlling factor for several supplementary processes in ripening of sweet corn. Two crops of Evergreen sweet corn were planted at College Park, Maryland, so that the 1st would mature in August and the 2nd in the cool of autumn. Samples of ears were collected at 2-day intervals after the tips of the silks had become dry to within  $\frac{1}{2}$  inch of the husk (pre-milk stage). The decrease in ratio of total sugars to starch was found to be a good measure of the rate of ripening. Six days after the 1st sampling, the early crop had reached the best canning condition (Total sugar: Starch = 0.566). Corn of the late crop ripening in cooler weather, required 15 days to reach the same stage—the rate of ripening in the 1st case being  $2\frac{1}{2}$  times as fast, due to the higher temperatures. From the field temperature records a mathematical equation was developed by which the rate of ripening can be calculated for any prevailing mean temperature. Thus, at 60°F., 14 $\frac{1}{2}$  days are needed to pass from pre-milk to best canning stage and the corn may be expected to remain in this stage for 5 days, while at 85°F. these periods are reduced to 5.5 and 1.5 days respectively.—In an effort to correlate the nail-test with composition, it was found that the reliability of the nail test is greatly influenced by rate of ripening and by rate of water loss through evaporation. In warm weather the nail-test alone is not a reliable means of predicting the best canning stage.—*J. T. Rosa.*

1503. BAILY, J. F. **Some Australian epiphytical orchids.** *South Australian Nat.* 1: 46-48. 1920.—A general discussion of the wild and cultivated Australian species is given.—*Wm. Randolph Taylor.*

1504. CONDIT, IRA J. **The caprifig situation.** *Associated Grower* 6<sup>3</sup>: 19. 1924.—Mamme figs should not be picked until 2-3 days after the 1st female Blastophaga wasps begin to emerge. Picked mamme figs should have the stems sealed with paraffine. They will keep best if buried to the eye in fine dry sand or dust.—*E. L. Overholser.*

1505. CONDIT, IRA J. **The fig industry of the Old World.** *Associated Grower* 6<sup>4</sup>: 8-9, 29. 1924.—The principal fig districts of the Old World border the Mediterranean. Much of the planting is on steep hillsides. Except in Algeria, but little new planting has been made since the World War. Propagation is by planting cuttings in place or rooting them in the nursery. Plantings on poor land are 30 feet apart and on better land 40 feet. Orchards are small. Trees begin to bear at 6-8 years and, if well cared for, do not decline until after 60 years. They seldom reach 100 years. The trees are less thrifty than in California. Pruning is practised indifferently. The trees are headed from a point very near the ground to as high as 5 feet. Fig trees are top worked by budding.—*E. L. Overholser.*

1506. DAVIS, R. A. **Culture of the orange.** *South Africa's vigorous citrus industry.* *Jour. Dept. Agric. Union South Africa* 8: 177-185. 4 fig. 1924.—The growth and possibilities of the industry are discussed.—*L. I. Goldblatt.*



1507. DREYER, D. J. The winter pruning of bush vines. South African Fruit Grower 11: 193-197. Fig. 1-8. 1924.—The author discusses winter pruning of bush vines from the 1st to the 5th year, and the pruning of vines in general. In South Africa it is a safe practice to have all vines pruned by August 15.—*L. I. Goldblatt.*

1508. EDQUIST, A. G. Notes on the vitality of the Soursop (*Oxalis cernua*). South Australia Nat. 1: 4-5. 1 fig. 1919.—Bulbs stored in 1915 were still viable in 1919, and had attempted to start growth in storage.—*Wm. Randolph Taylor.*

1509. FITZPATRICK, T. J. The arborescent flora of midwest farmsteads. Proc. Iowa Acad. Sci. 30: 359-364. 1923 [1924].—This is an annotated list of cultivated woody plants of Buffalo County, Nebraska. The commonest shrubs are *Syringa vulgaris*, *S. persica*, *Spiraea van Houttei*, *Lycium vulgare*, and roses. The commonest trees are *Populus Sargentii*, *Juniperus virginiana*, *Acer Negundo*, *Fraxinus viridis*, *Ulmus americana*, *Maclura aurantiaca*, and *Ailanthus glandulosa*. [See also Bot. Absts. 13, Entry 3212].—*H. S. Conard.*

1510. GROSSENBACHER, J. G. Fertilize for heavy spring bloom. Citrus Indust. 5<sup>10</sup>: 9, 32. 1924.—This is a discussion of the fall fertilization of citrus groves in Florida with reference to the value of the fall application and the composition and rate of application of the fertilizer. Fall fertilization is considered to be a most important factor in determining the amount of bloom to develop in the following spring. The fall is also regarded as a most critical time for all underfed groves in that they are sure to deteriorate more rapidly from then on if not given a liberal application of fertilizer at this time.—*Arthur S. Rhoads.*

1511. HENRICKSEN, HENRY C. A preliminary report on pineapple shipping problems. Jour. Bd. Agric. British Guiana 16: 102-109. 1923.—This work is concerned chiefly with the influence of temperature during storage on maturity of pineapples. In the experiments discussed, temperature was not controlled very closely. From each of 2 lots, one mature and the other immature, pineapples were stored at temperatures of 49-51°F. and at 35-45°F. Where the pineapples were cooled to 35°F., tests for maturity were made by noting: (1) development of color; (2) changes in the content of acid and total solids; (3) CO<sub>2</sub> given off; and (4) flavor and general appearance of fruit. It was found that marked maturity changes occur in fruit that has been cooled to 35°F. Pineapples picked at the so-called bronze stage of ripeness will become fully colored 5-6 days after reaching New York even if kept at 35°F. in transit. When the fruit is kept at constant temperature of 35°F. it may be picked practically ripe with assurance that will reach the market safely. It would be dangerous to carry the ripe fruit at 50-60°F.—*J. P. Jones.*

1512. HEPPNER, M. J. Roots and their adaptabilities. Amer. Fruit Grower 44<sup>10</sup>: 31. 1924.—The author points out that many orchards are deteriorating chiefly because of the unsuitability of the rootstock to the particular soil conditions. The soil requirements of the almond, apricot, Myrobalan plum, Mahaleb and Mazzard cherry, and Japanese and French pear roots are discussed in order to show how each root is best suited to particular soil conditions. It is pointed out also that the question of affinity between stock and top should always be considered before making a final selection of the rootstock.—*Arthur S. Rhoads.*

1513. ISING, E. H. Orchids growing from seed. South Australian Nat. 1: 58-59. 1920.—Instances of free seeding and germination in the wild state are recorded.—*Wm. Randolph Taylor.*

1514. K., W. J. Gardening topics for the high veld. South African Gard. and Country Life 14: 127-128. 1924.—Successful gardening is discussed from the point of view of proper soil cultivation and preparation.—*L. I. Goldblatt.*

1515. L., T. N. Orchids for the high veld. South African Gard. and Country Life 14: 126. 2 pl. 1924.—There are 2 families of orchids well deserving culture in the Transvaal, not only by reason of their great beauty, but because the climate of the high veld seems particularly suited to them. They are the Angraecums and the Dendrobiums. About 10-12 species of the latter will do well.—*L. I. Goldblatt.*

1516. MANN, A. G. Dr. E. E. Schmidt's Feurte avocado tree. Citrus Indust. 5<sup>10</sup>: 20-21, 25. 1 illus. 1924.—A description is given of a "sport" Feurte avocado tree growing in the yard of E. E. Schmidt's place at Blanton, Pasco County, Florida. This tree, although but 4 years and 10 months old and unfertilized is at least 20 feet high, with a crown diameter of 20

feet and it bears profusely. This tree, located on one of the highest points of Pasco County, is regarded as suitable for the high sandy soils of central Florida and as the foundation for a large avocado industry in this part of the State.—*Arthur S. Rhoads*.

1517. MANUEL, H. L. A remarkable yield from Shiraz grapes. *Agric. Gaz. New South Wales* 35: 658. 1924.—A vineyard of 6.5 acres gave a yield of over 8 tons per acre.—*L. R. Waldron*.

1518. MENDIOLA, N. B., AND JUAN O. UNITE. Breeding ornamental hibiscus II: Artificial and natural selection for dwarf, medium and tall seedlings. *Philippine Agric.* 13: 45-47. 1 pl. [For abstract see this issue, Entry 1446.]

1519. MORGAN, E. M. Fruit cultivation. *Jour. Bd. Agric. British Guiana* 16: 147-151. 1923.—The most favorable time for planting fruit trees is toward the last 3 months of the year. A deep, rich but not too heavy, soil properly prepared first by surface cultivation and then by deep plowing and burying at least 2 feet deep as much grass and leaves as possible to lighten the subsoil, is advised. It is important to select healthy trees and to space them according to the capacity of the soil to produce. It is desirable to plant when the soil is not wet and to throw friable molds over the roots of each tree.—*J. P. Jones*.

1520. MUGNIER, LOUIS. Rubigineuses hétéropodes. [A group of roses by this name.] *Bull. Soc. Bot. France* 71: 304-307. 1924.—The article contains descriptions of *Rosa heteropoda* Gdgr., *R. Mugnerii* Lambert, and of *R. araedena* Mugnier which seems to be intended for a new species.—*P. A. Young*.

1521. NILES, L. D. Avocados in Florida. *Citrus Indust.* 5<sup>9</sup>: 20-21; 5<sup>10</sup>: 29. 1924.—This is a general account of avocado growing in Florida with reference to soil, varieties planting and cultivation, insects and diseases, fertilizing, harvesting and marketing, and propagation.—*Arthur S. Rhoads*.

1522. NILES, L. D. Florida banana industry. *Citrus Indust.* 5<sup>10</sup>: 10-11. 1924.—This is a general account of banana growing in Florida with reference to soils, varieties, planting, propagation, cultivation, fertilization, insects and diseases, and harvesting and shipping.—*Arthur S. Rhoads*.

1523. O'BYRNE, F. M. Analysis of citrus nursery situation. *Citrus Indust.* 5<sup>8</sup>: 10-12, 24. Fig. 1-3. 1924.—The past, present and future of the citrus nursery business in Florida are discussed.—*Arthur S. Rhoads*.

1524. PULLEINE, R. H. Rock and alpine gardening on the plains. *South Australian Nat.* 1: 56-58. 1920.—This consists of general cultural directions.—*Wm. Randolph Taylor*.

1525. SCHMIDT, RICHARD. Sugar content increases returns. *Associated Grower* 5<sup>8</sup>: 11. 1 fig. 1923.—Grape growers use a saccharometer to test the grapes for time to pick as raisins. Juice from several bunches is extracted and tested. Unless the juice contains 24% or more of sugar the drying ratio will be high and the product of poor quality.—*E. L. Overholser*.

1526. SHAW, N. H. Deciduous fruit. A well known South African product. *Jour. Dept. Agric. Union South Africa* 8: 186-194. 4 fig. 1924.—Apples, pears, apricots, peaches, plums and prunes are discussed under the various headings: Distribution; export trade; selection of varieties; methods of planting; cultivation; fertilizers and manures; handling of fruit; picking; costs of establishment of orchards, etc.—*L. I. Goldblatt*.

1527. SMITH, CHARLES W. Bush fruits. Their place on the farm. *South African Fruit Grower* 11: 139. 1924.—Cultivation of the logan berry and raspberry, as minor crops, is discussed.—*L. I. Goldblatt*.

1528. SMITH, CHARLES W. The popular peach. *South African Fruit Grower* 11: 224. 1924.—Peach growing in South Africa is discussed. One of the chief defects in present practices is the failure to plant good varieties.—*L. I. Goldblatt*.

1529. STIRLING, FRANK. Florida citrus grove plantings. *Citrus Indust.* 5<sup>8</sup>: 16, 25. 1924. This is an outline of the development of citrus grove plantings in Florida from the time of the Spaniards to the present. From practically nothing, so far as is known, in 1824, citrus grove plantings have reached a total of 253,000 acres in 1924, the development within the last few years being remarkable. Most of the citrus industry in Florida is located within a radius of 150 miles, from Winter Haven or Lakeland as the center. It is considered that perhaps no more than  $\frac{1}{2}$  of the available citrus land in Florida has been planted.—*Arthur S. Rhoads*.



1530. U., TYOSUN. On the distinguishableness of some races of morning glory according to their seed-characters. (Japanese.) Idengaku Zassi (Japanese Jour. Genetics) 1: 101-106. 5 fig. 1922.—A race of morning glory known by the Japanese name "Tubame" is distinguished from the normal by its cotyledons which are much smaller, thicker and much more poorly veined, its leaves which are also smaller and thicker, its stem which is narrower and more richly branched, its inflorescence which is a cyme of rather complicated character bearing many flowers instead of 1-3 (which is the case in the normal race), its flowers which are provided with smaller deeply pentalobed corolla and rudimentary sexual organs, and further by its absolute self- as well as cross-sterility. There is a certain race of apparently quite normal character which, when self-fertilised, always segregates out plants of the abnormal race just noted, in the ratio 3 normal: 1 abnormal. The author has discovered the fact that these 2 races may be easily recognized by their respective seed characters, so that no culture is necessary for their distinction. Thus, the cotyledons of the abnormal race are much smaller than those of the normal and not at all folded, as is always the case in the latter; the lateral face of the seed is flat in the normal, while in the abnormal it shows a slight concavity evidently due to the contraction of the seed-coat in drying; seed of the latter are also much lighter (= 67.2 % of the normal).—*Author.* (Courtesy Japanese Jour. Bot.)

1531. VERDOORN, INEZ C. The economic plants of South Africa. Notes from the National Herbarium. 1. The Kameeldoorn (*Acacia giraffae*). Jour. Dept. Agric. Union South Africa. 8: 414-416. 1 fig. 1924.—The pods of this tree are eagerly eaten by stock and are found to be very fattening. It is said that when cows are fed on the pods there is an increased milk yield though it was found that if the meal is fed just before milking time, the milk is unpleasantly flavored. Chemical analysis of the pods is given.—*L. I. Goldblatt.*

## MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 1104, 1111, 1171, 1177, 1204, 1223, 1229, 1234, 1242, 1309, 1641, 1830, 2048)

1532. ARTSCHWAGER, ERNST. Studies on the potato tuber. Jour. Agric. Res. 27: 809-835. 10 pl., 8 fig. 1924.—This is a detailed anatomical and ontogenetic study of the tuber of the Irish potato, together with a consideration of such internal characters as might aid in the task of grouping potato varieties or establishing their relationship.—*Author.*

1533. BAILEY, I. W. So-called bars or rims of Sanio. Bot. Gaz. 78: 124-125. 1924.—The author points out the contradictory conclusions in recent papers as regards nomenclature, form, and chemical composition of these structures and their distribution in regions or organs of the Coniferae. He concludes that "extensive developmental investigations are essential if the protracted controversy concerning the significance of so called bars or rims of Sanio is not to become a *reductio ad absurdum*."—*B. W. Wells.*

1534. BOWER, F. O. The relation of size to the elaboration of form and structure of the vascular tracts in primitive plants. Proc. Roy. Soc. Edinburgh 43: 117-126. 1923.—The present paper cites specific data relating to the subject, from plants of recognized geologic antiquity. The data seem to indicate that: (1) In the Coenopterideae the stele increases in size in greater ratio than the stem and assumes a fluted or stellate contour; (2) in the petioles of the same group increased size is accompanied (with some exceptions) by increased complexity of the vascular tract; (3) in Psilophytales and Psilotales the stele increases in size in greater ratio than the stem, and the xylem becomes fluted or stellate; (4) increased complication of the xylem may occur without accompanying fluting of stele contour, indicating a possible factor in the surface of exchange necessary between xylem and phloem; (5) xylem stellation and xylem differentiation are not mutually dependent; (6) stellate development of stele or of xylem is not dependent upon the presence of leaf traces; (7) the elaborated condition of the Zygopterid petiole originated following medullation of an originally solid protostele; (8) xylem stellation in some forms owes its origin to intrusion of phloem into the xylem; (9) such

factors as mechanical needs of size, ventilation of inner tissues, and water storage only partially account for the decentralization of the vascular tract always accompanying increased size.—*Ray C. Friesner.*

1535. CALVINO, EVA MAMELI DE. *Anomalies sexuales en la floracion del Codieaum variegatum (L.) Bl.* [Sexual anomaly in the blossoming of *Codiaeum variegatum (L.) Bl.*] *Rev. Agric. Com. y Trab. Cuba* 5: 44-46. *Fig. 1-2.* 1923.—Since female flowers mature before the male in the same plant of this species, there are periods when it is practically unisexual, and transitional stages have been observed between typical monoecism and temporary dioecism. Although infrequent cases of hermaphrodite flowers on the male inflorescence have been found, the presence of female flowers on the male inflorescence is the more common variation. Such androgynous inflorescences are solitary, the thickened peduncles distinctly marked with a longitudinal furrow suggesting fasciation; examination of cross sections furnishes further evidence to support this hypothesis. The conclusion is therefore drawn that the morphological variation is a result of the fusion of 2 proximal axillary inflorescences of different sex.—*Edith K. Cash.*

1536. CAMUS, AIMÉE. *Quelques anomalies florales chez les Orchidées.* [Some anomalous flowers of the *Orchidaceae.*] *Bull. Soc. Bot. France* 71: 86-91. 1924.—The author describes several anomalous orchid flowers saying that some of them represent returns to regular perianth types, especially in *Ophrys*.—*P. A. Young.*

1537. COOK, WILLIAM S. *The structure of some nectar glands of Iowa honey plants.* *Proc. Iowa Acad. Sci.* 30: 301-329. 1923 [1924].—The nectaries of *Philadelphus coronarius*, *Pyrus communis*, *P. Malus*, *Prunus virginiana*, *Physocarpus opulifolius*, *Crataegus mollis*, *Spiraea* sp., *Trifolium repens*, *Tilia americana*, *Petunia violacea*, *Catalpa bignonioides*, *Lonicera tatarica*, and *Cucurbita Pepo* are described superficially and histologically.—*H. S. Conard.*

1538. CZURDA, VIKTOR. *Zur Kenntnis der Brutzwiebeln von Lycopodium Selago und L. lucidulum.* [Bulblets of *Lycopodium Selago* and *L. lucidulum*.] *Flora* 116: 457-475. 7 *fig.* 1923.—The periodic production of bulblets is apparently not due to climatic conditions. The zones, of which there may be several in 1 season, show great uniformity on the branches of any 1 plant, but differ widely on plants growing close together. There is no abscission layer, but the small diameter and the shape of the stem at the junction of the bulblet with the dwarf shoot facilitate separation. The elasticity of the elater-leaf (a thick boat-shaped leaf on the abaxial side of the dwarf shoot) causes it to cast off the bulblet at maturity if there is external pressure on the tip of the bulb, such as from wind or falling leaves. Germination of bulblets occurs in 4-7 days in favorable weather. They retain their viability for over 6 months in moist air and for several weeks in dry air.—*A. G. Stokey.*

1539. HÅKANSSON, ARTUR. *Studien über die Entwicklungsgeschichte der Umbelliferen.* [Studies in the life history of the *Umbelliferae.*] *Lunds Univ. Årsskr. Avd. 2*, 187: 1-120. 1 *pl.*, *fig. 1-18.* 1922 [1923].—Little has been known about the development of pollen and the embryo sac in the *Umbelliferae*. These parts of the life history were studied in members of the *Hydrocotyleae*, *Mulineae*, *Saniculeae*, *Scandiceneae*, *Coriandreae*, *Smyrnieae*, *Ammineae*, *Peucedaneae*, *Laserpitieae*, and *Dauceae*. The author also discusses the relationships of the genera investigated and of the systematic position of the family.—*Frederick V. Rand.*

1540. HERBERT, D. A. *Pistillody of papaya ovules.* *Philippine Agric.* 13: 107-108. 1 *pl.* 1924.—Several carpels containing minute ovules were found among the seed in a papaya fruit (*Carica papaya*).—*Sam F. Trelease.*

1541. HUTCHINSON, A. H. *Embryogeny of Abies.* *Bot. Gaz.* 77: 280-289. *Pl. 17-20.* *fig. 1-8.* 1924.—The proembryo of *Abies* ordinarily consists of 8 cells in 2 tiers; sometimes it has a 3rd tier which aborts and may represent the rosette "or the suspensor." Cleavage polyembryony was frequently found occurring in about 10% of the cases studied and is regarded as "the result of modified spindle structures" in the proembryo. The early embryo grows by intercalary divisions and an apical cell is not formed. The protoderm is delimited from the central region before cotyledon formation and these regions persist as primary structural units. The author also states that "the stem tip and the initials are regions composed of resting cells in the early embryo." He concludes that *Abies* shows "many advanced or derived characters."—*J. T. Buchholz.*



1542. ISHII, KIYOO. Studies on the principal vegetable fibres in Japan. (Japanese.) Bot. Mag., Tôkyô 35: (127)-(137). 11 fig. 1921.—The author has examined the chemical constituents and the dimensions of the following vegetable fibres in raw materials—the results are as follows:

SAMPLES		CELLULOSE (%)	DIMENSIONS OF THE FIBRES	
			Length (mm.)	Diameter ( $\mu$ )
<i>Corchorus capsularis</i>	Bast fibres	59.57	0.077— 4.43	10—23
<i>Linum usi atissimum</i>	Bast fibres	66.70	10.2 — 50.9	13—31
<i>Boehmeria nivea</i>	Bast fibres	72.48	63.0 —242.0	42—66
<i>Cannabis sativa</i>	Bast fibres	71.90	20.10— 33.50	12—23
<i>Edgeworthia papyrifera</i>	Bast	46.45	1.20— 5.14	14—32
<i>Wikstroemia sikokianum</i>	Bast	37.57	2.32— 3.83	16—30
<i>Broussenetia Kasinoki</i>	Bast	56.00	0.94— 21.07	12—42
<i>Morus alba</i>	Bast	46.74	1.25— 25.41	10—32
<i>Oryza sativa</i>	Stem	38.31	0.29— 1.41	5—29
<i>Avena sativa</i>	Stem	37.07	0.58— 2.42	10—31
<i>Hordeum vulgare</i>	Stem	39.94	0.80— 2.03	11—22
<i>Triticum vulgare</i>	Stem	42.11	0.46— 2.01	11—22
<i>Phragmites communis</i>	Stem	46.23	0.51— 2.33	8—22

—Author. (Courtesy Japanese Jour. Bot.)

1543. ISING, E. H. Notes on *Styphelia serrulata* Labill. South Australian Nat. 2: 20-23. 1921.—This includes notes on flowering and general structure.—Wm. Randolph Taylor.

1544. KUDO, YUSHUN, AND NOBORU YAMABAYASHI. [Anatomical studies of the wood of the Betulaceae in Hokkaido.] (Japanese.) Res. Bull. Exp. Forest Sapporo 1: (15)-(40). 4 pl. 1921.—The authors describe the anatomical structure of the wood of the following 8 species of Betulaceae native to Hokkaido: *Carpinus cordata*, *C. laxiflora*, *Ostrya japonica*, *Betula Maximowicziana*, *B. Ermanni*, *B. japonica*, *Alnus japonica* and *A. hirsuta*. The wood consists chiefly of vessels, tracheids and wood-parenchyma cells. The vessels are arranged in regular radial rows, are comparatively small and are pitted on the walls adjacent to the ray cells. In the spring wood there are many rows of tracheids which are many-sided in outline, thin-walled and weak; but in the fall wood there are only a few rows. The anatomical distinctions between the various birch woods of Hokkaido are presented in a table. The authors discuss the relation between the anatomical structure and the uses of the woods native to Hokkaido.—Authors. (Courtesy Japanese Jour. Bot.)

1545. LINSBAUER, K. Über blattbürtige Knospen bei *Lycopersicum*. [Foliar buds in *Lycopersicum*.] Oesterreich. Bot. Zeitschr. 73: 191-200. 3 fig. 1924.—The writer observed in certain tomato plants the development of foliar shoots arising from the base of the median pinnae. The vascular tissue of the new shoots became inserted on the lateral bundles of the petiole of the supporting leaf. On the whole, the vascular tissue of the petiole at the insertion point of the shoot, did not change; there was, especially, no tendency toward the formation of a closed cylinder, though an increased xylem formation was noted. The foliar shoots remained green even after the leaves supporting them were dead. This observation suggests water conduction through dead tissues.—Ernst Artschwager.

1546. MARTIN, J. N. The structure and development of the seed coat and delayed germination in *Melilotus alba*. (Abstract.) Proc. Iowa Acad. Sci. 29: 345-346. 1922 [1924].—H. S. Conard.

1547. MARTIN, J. N., FRED C. WERKENTHIN, AND ELIZABETH HUDSON. Structure and function of the stigma in relation to the germinative requirements of the pollen in the easter lily. (Abstract.) Proc. Iowa Acad. Sci. 29: 345. 1922 [1924].—H. S. Conard.

1548. NISHIMURA, MAKOTO. On the germination and the polyembryony of *Poa pratensis* L. Bot. Mag. Tôkyô, 36: 47-54. 1 pl. 1922.—This preliminary note contains 2 chapters,

"Characteristic features with germination" and "Polyembryony in *Poa pratensis*" from the author's paper published in Japanese Jour. Bot. 1: 55-85. 1922.—*Author.* (Courtesy, Japanese Jour. Bot.)

1549. OGURA, YUDZURU. On the gaps in the stele of some Polypodiaceae. Bot. Mag. Tôkyô 35: 113-125. 4 fig. 1921.—According to the stelar theory it is generally admitted that dictyostely is derived from the solenostely by the overlapping of the foliar gaps in the stele, the overlapping being due to 2 factors, namely, the prolongation of the gaps and the shortness of the internodes. The writer's observation on the stele of some Japanese Polypodiaceae has led him to a view quite different from this since even in a stele with long internodes, the dictyostelic condition may be present. Between the succeeding foliar gaps on the stele there exists a constant relation which does not vary according to the shortness or longness of the internodes.—*Author.* (Courtesy Japanese Jour. Bot.)

1550. PAMMEL, L. H., AND C. M. KING. Germination studies of some shrubs and trees. Proc. Iowa Acad. Sci. 29: 257-266. Illus. 1922 [1924].—Description and figures of seedlings of *Quercus Gambellii*, *Pasania densiflora*, *Maclura pomifera*, *Prunus caroliniana*, *Rhus Toxicodendron*, *Rhus canadensis*, *Gleditsia aquatica*, *Rhamnus californica*, *R. tinctoria*, "*Lycium halimiflorum*" and *Shepherdia argentea* are given together with time required for germination of seed.—*H. S. Conard.*

1551. PAMMEL, L. H., AND C. M. KING. Germination studies of some trees and shrubs. Proc. Iowa Acad. Sci. 30: 287-293. Illus. 1923 [1924].—Figures and description of seedlings of *Crataegus mollis*, *C. Margaretta*, *C. grusgalli*, *Berberis thunbergii*, *Rosa blanda*, *Symphoricarpos occidentalis*, *Viburnum Lentago*, *Ligustrum amurense*, *Pyrus americana*, and *P. ioensis* are given together with time required for germination of seed.—*H. S. Conard.*

1552. PAMMEL, L. H., AND C. M. KING. Studies in the germination of some woody plants. Proc. Iowa Acad. Sci. 28: 273-282. Illus. 1921 [1923].—Description and figures of seedlings of *Tsuga canadensis*, *Carya illinoensis*, *Fagus grandifolia*, *Ribes floridum*, *Ptelea trifoliata*, *Acer Saccharum*, *Eleagnus angustifolia*, and *Cornus Amomum* are given together with time required for germination of seed.—*H. S. Conard.*

1553. SMITH, ISOBEL S. Seedling vascular anatomy of *Nelumbo lutea*. Illinois Acad. Sci. Trans. 16: 91-99. Fig. 1-12. 1923.—The purpose of the investigation was to throw some light on the origin of the monocotyls and dicotyls. Incidentally, the studies by others on development of megasporangium, megaspore, female gametophyte, proembryo and embryo were confirmed. The massive spherical proembryo without a suspensor is considered to be a primitive characteristic. The root appears to be of a dicotyl type. The vascular structure elsewhere is of the generally accepted monocotyledonous type as shown by (1) 3 vascular strands to each leaf and cotyledon in the juvenile stages, (2) polystelic bundle arrangement, (3) rhizome and epicotyl bundles collateral and without stelar cambium. However a very few of the dicotyls are without stelar cambium and some monocotyls are said to show traces of stelar cambium. The venation of the adult leaf is dicotyledonous. One cotyledon precedes the formation of the 2nd. The author concludes that *Nelumbo lutea* is phylogenetically one of the higher angiosperms having both monocotyledonous and dicotyledonous characteristics. The fibro-vascular bundles are strongly monocotyledonous but throw no light on the origin of the seed plants.—*H. W. Anderson.*

1554. STOVER, E. L. The vascular anatomy of *Calamovilfa longifolia*. Ohio Jour. Sci. 24: 169-179. 1 pl. 1924.—The vascular strand of this species starts with a single cell in the leaf primordium. In elongating parts, annular and spiral protoxylem elements appear first. The pericycle develops after the differentiation of phloem and metaxylem. In the rhizome the internode does not elongate and annular and spiral protoxylem elements do not develop. Two bundles laid down together constitute the amphivasal bundle of the nodes. There is no cambial activity in the vascular bundle and elongation occurs from a diffuse region of dividing cells. The amount of elongation determines whether the tracheae are annular, spiral, reticulate or pitted vessels. All types are at first pitted, the walls being later stretched by the growth of surrounding cells. The original pitted thickening arises by the vacuolation of the cytoplasm, the thickening being laid down by the thicker portion of the cytoplasm.—*H. D. Hooker, Jr.*



1555 Заленский, В. и З. Сычовская [ZALENSKI, V., AND Z. SYCHOVSKAIA] **Анатомические коэффициенты в многоярусных сообществах.** [Anatomical coefficients of plant associations of different heights.] *Дневник Русского Ботанического Конгресса* [Jour. Russian Bot. Congress] 1: 65. 1921.—A regular, progressive change in the anatomical coefficient of the leaves of plants may be observed in oak forests, beginning with the leaves of the plants of the forest floor (*Asarum*, *Aegopodium*, etc.) to those of bushes (*Euonymus*, *Corylus*) and then to the lower, middle and finally the upper leaves of the oaks. The dimensions of the cells gradually decrease while the number of cells per unit of leaf area increases. The osmotic pressure rises progressively from the leaves of *Asarum* to those of the upper levels of oak trees.—V. Malchevski.

## MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

L. H. TIFFANY, *Assistant Editor*

(See also in this issue Entries 1169, 1192, 1230, 1237, 1261, 1276, 1809, 1813, 1949, 2076)

1556. ALLEN, WINFRED EMORY. Quantitative studies on inshore marine diatoms and dinoflagellates of southern California in 1920. Univ. California Publ. Zool. 22: 369-378. 1922.—“It is certain from the excellent condition of the series from Pt. Hueneme that a trustworthy untrained man can do satisfactory work in plankton collecting by our measured water method. As is shown in table 1 the average number of diatoms is much greater through most of the year than is the average number of dinoflagellates. . . . As is shown in the discussion of morning and evening catches, the behavior of diatoms and dinoflagellates is not enough alike to warrant my former practice of discussing them together as a photosynthetic assemblage, since the morning catches of diatoms exceeded those of the evening while the evening catches of dinoflagellates exceeded those of the morning. The studies of this year have yielded continued evidence that distribution of organisms in sea water is not uniform. . . . At neither station was there much variation in the kinds of diatoms and dinoflagellates according to time of year. There was some suggestion of the possibility that two or three forms are relatively stable and constant and that one or two other forms may gain prominence through marked responsiveness to seasonal differences. . . . ”—(From author's summary and conclusion.)

1557. BRÜHL, PAUL, AND KALIPADA BISWAS. On a new species of *Cylindrospermum* from Bengal—*C. doryphorum* Brühl et Biswas. Jour. & Proc. R. Asiatic Soc. Bengal 18: 577-580. 1 fig. 1923.—The genus and related species are briefly discussed and *C. doryphorum* n. sp. is described. The specific name was given referring to the quite constant spear-shape of the heterocysts.—Frederick V. Rand.

1558. CARTER, NELLIE. Freshwater algae. (In: A systematic account of the plants collected in New Caledonia and the Isle of Pines by Prof. R. H. Compton, M.A. in 1914. Pt. 3. Jour. Linn. Soc. Bot. 46: 13-96.) P. 47-68. Pl. 4, fig. 1. 1922.—These collections, made for the most part either from running streams or from subaerial habitats, were particularly rich in diatoms. They yielded interesting forms of Cyanophyceae, and were fairly abundant in filamentous Chlorophyceae (mostly in a sterile state), and in desmids. The writer gives a systematic discussion of the species and varieties found in identifiable condition: Flagellata 1, Dinoflagellata 1, Cyanophyceae 33, Bacillarieae 59, Chlorophyceae 72. Of the latter 50 are desmids. The following are described as new *Gloeotheca vibrio* n. sp., *Rosaria ramosa* n. gen. et sp., *Mastigocoleus obtusus* n. sp., and *Cosmarium binum* Nordst. *angustatum* n. var. *Rosaria* is a new genus of the Stigonemaceae somewhat resembling *Hapalosiphon*, but differing in the absence of heterocysts, in its irregular branching, and in the usual absence of a sheath. A revision of the generic description of *Mastigocoleus* is necessitated by the entire absence of heterocysts in *M. obtusus*.—L. H. Tiffany.

1559. GEITLER, L. Der Zellbau von *Glaucocystis nostochinearum* und *Gloeochaete Witrockiana* und die chromatophoren-symbiosetheorie von Mereschkowsky. [Cell structure of

**Glaucocystis nostochinearum** and **Gloeochaete Wittrockiana** and the chromatophore symbiotic theory of Mereschkowsky.] *Archiv Protistenk.* 47: 1-24. *Fig. 1-8.* 1923.—The writer discusses the nature of the cell walls, the chromatophores, and the protoplasm of these 2 algae with reference to their systematic position. Both forms were grown in dilute Benecke's solution. The chromatophores differentiated into peripheral bluegreen and central colorless regions, like small bluegreen algae. Using the same color methods, the author secured similar differentiation in species of bluegreens. Some of the chromatophores of *Glaucocystis*, isolated from the cell, lived for 24 hours. The theory of Mereschkowsky that all plant chromatophores were derived from independent organisms, like bluegreens, is discussed, and evidence is given that the chromatophores of *Glaucocystis* and *Gloeochaete* are "rebuilt" independent organisms of a bluegreen nature. Whether or not Mereschkowsky's theory is of general application remains to be seen.—*L. H. Tiffany.*

1560. GEPP, A. Marine algae. (In: A systematic account of the plants collected in New Caledonia and the Isle of Pines by Prof. R. H. Compton in 1914. Pt. 3. *Jour. Linn. Soc. Bot.* 46: 13-96.) P. 45-46. 1922.—The writer lists from these collections 7 species of Chlorophyceae, 5 Phaeophyceae, and 6 Rhodophyceae.—*L. H. Tiffany.*

1561. GICKLHORN, JOSEF. Ueber den Blauglanz zweier neuer Oscillatorien. [The bluish sheen of two new species of Oscillatoria.] *Oesterreich. Bot. Zeitschr.* 7: 1-11. 3 *fig.* 1921.—Two new species of Oscillatoria have recently been found in the vicinity of Graz. They differ from other members of this genus in having a bluish sheen and in growing only in H<sub>2</sub>O containing H<sub>2</sub>S. They are described as *Oscillatoria caerulescens* and *O. minima*. The latter has much more slender filaments than the former. The bluish sheen appears when a mount containing the filaments is viewed by reflected light against a dark background. The slide must be at an angle of about 70° from the horizontal. The color disappears after fixing, warming, or drying. It is not visible when all the filaments are horizontal and is not seen when monochromatic light is used. It is not simply the phycocyanin since it does not appear when other species of *Oscillatoria* having filaments of the same size are used. The only fluorescence to be observed is that of chlorophyll. The explanation is probably that the cell membranes or cell contents under these conditions absorb all the light except the blue.—The filaments are surrounded by a thin gelatinous sheath. At the ends there is a spherical slimy mass. This is thrown off as the filaments move. When the filaments are broken another mass develops with great rapidity. It is suggested that this ball of slime has something to do with the motion of the filaments.—Both plants are resistant to H<sub>2</sub>S and are often found on the bodies of dead animals in the water. *O. caerulescens* remained alive 10 days in water saturated with H<sub>2</sub>S. One could take advantage of this property in securing a pure culture of these forms.—*T. D. Howe.*

1562. GRIFFITHS, B. MILLARD. The heleoplankton of three Berkshire pools. *Jour. Linn. Soc. Bot.* 46: 1-11. Pl. 1, *fig. 1-12.* 1922.—Collections of plankton were taken from these pools in June and July, 1920, by means of a silk net towed behind a boat at a depth of a few inches below the surface. The list of algae, giving the comparative abundance for the 3 pools, includes the following groups: Chlorophyceae 46, Heterokontae 1, Bacillariae 4, Myxophyceae 5, Peridineae 9, Dinobryaceae 1. The writer discusses the nature of the algal flora found, with special notes on a few planktonic forms. *Peridinium suttoni* is described as a new species.—*L. H. Tiffany.*

1563. GROVES, JAMES. Charophyta. (In: A systematic account of the plants collected in the New Caledonia and the Isle of Pines by Prof. R. H. Compton M. A. in 1914. Pt. 3. *Jour. Linn. Soc. Bot.* 46: 13-96.) P. 69-70. Pl. 5. 1922.—*Nitella pseudo-flabellata* Braun, *N. hyalina* Ag., *N. gelatinosa* Braun, *Chara australis* R. Brown, and *C. gymnopitys* Braun are listed, and *Nitella comptonii* is described as a new species, from these collections.—*L. H. Tiffany.*

1564. HEITZMANOWNA, WANDA. Przyczynek do znajomości brunatnic polskiego Bałtyku. [Contribution to the knowledge of the brown algae on the Polish shores of the Baltic.] *Acta Soc. Bot. Poloniae* 2: 66-67. 1924.—The author reports *Halidrys siliquosa* Lyngb. and *Chordaria flagelliformis* Ag. as new to the region, and calls attention to exceptionally large specimens of *Chorda filum* L. (190 cm.) and *Dictyosiphon foeniculaceus* Grew (42 cm.).—*C. W. Dodge.*



1565. HINMAN, JACK J., JR. *Algae*. Proc. 16th Ann. Conv. Indiana Sanitary and Water Supply Assoc. 1923: 65-66. 1923.—In the southwestern part of Iowa surface streams are small, and impounding reservoirs are required for an adequate water supply. There is much trouble with algae. Much of the water is high in  $F_e$  and promotes the growth of *Crenothrix*. For 5 years algae were troublesome in the 7-million-gallon reservoir at Dubuque. The trouble was finally remedied by covering the reservoir. Burlington had trouble with bluegreens; Davenport had similar trouble. In the latter case *Oscillatoria* caused an odor that brought complaint from near-by residents. Iowa City had trouble with *Cyclotella*, which imparted a brownish color to the water. This diatom was presently eradicated by chlorination before the water passed into the settling basin. Copper sulphate had given poor results.—W. C. Purdy. [Public Health Engineering Absts.]

1566. IKARI, JIRO. *Development of Laminaria religiosa* Miyabe. (Japanese.) Bot. Mag. Tôkyô 35: (207)-(218). *Illus.* 1921.—The results obtained by the author from the culture of zoospores of *Laminaria religiosa* Miyabe, are essentially the same as those obtained by Kylin and Sauvageau. Some points worthy to be mentioned may be summarized as follows: The zoospore has a clear red eye-spot, contrary to the observations of Kylin and Sauvageau; it shows positive heliotropism.—The embryospore germinates in a few days after being liberated from the mother frond. The distal end of the germinating tube grows up gradually into a globose cell, and the cell-contents, including the chromatophore are translocated into the newly formed spherical part, though a small portion remains in the original place. The chromatophore then divides into 2, and the transverse partition is formed. Around this stage the eye-spot disappears.—This gametophytes are mostly dioecious. The oospore which escapes after the dehiscence of the oogonium firmly adheres to the funnel-shaped hollow formed on its neck; the basal part of the oospore closely fits up to the latter. The antheridia sometimes make up a single continuous row after the manner of the gemetangium of *Ectocarpus*, with a common opening formed in the terminal part of the row.—Very rarely monoeocious gametophytes are observed.—When the temperature of the culture medium is high, the embryospore soon develops and takes a complicated form; on the contrary, when it is low, the development is retarded, and takes a less complicated form.—In the young frondlets found in the natural habitat the sporophytes are formed in the same way as in artificial culture. It is however doubtful whether the embryospore will develop in nature into a protonema-like thallus, as produced in the artificial culture. According to the supposition of the author the embryospore of *Laminaria religiosa*, which may either soon develop to an oospore or remain long in the 1 - to few-celled state, produces the sporophytes after a long interval of time.—The union of 2 sexual elements is still unobserved.—*Author.* (Courtesy Japanese Jour. Bot.)

1567. MARUKAWO, HISATOSI. *Illustrations for the identification of plankton organisms. Part I. Peridineae.* (Japanese.) 84 p. Tokyo, 1921.—The book consists of 2 parts, the 1st of which gives 277 figures in 34 tables of Japanese and foreign Peridineae; the 2nd part contains a general discussion of the Peridineae with keys to, and descriptions of, each species.—*Author.* (Courtesy Japanese Jour. Bot.)

1568. NITARDY, E. *Neue Kryptogamen des Elbinger Kreises.* [New cryptogams from the Elbing District.] Ber. Westpreuss. Bot.-Zool. Vereins 44: 6-7. 1922.—The author lists additions and corrections to his "Elbinger Algen" and his "Kryptogamenflora des Kreises Elbing." Additions to the latter include bacteria, lichens, and fungi.—No new species are given.—*Frederick V. Rand.*

1569. OKAMURA, KINTARÔ. *Icones of Japanese algæ.* Vol. 4<sup>3</sup>: (21 p.); 4<sup>4</sup>: (23 p.). 5 + 5 pl. (Explanations in English and Japanese.) Tôkyô, 1921.—No. 4 contains *Heterosiphonia pulchra* (Okam.) Fkbg., *H. japonica* Yendo, *Delesseria crassifolia* Rupr., *Cladophoropsis fasciculatus* (Kjellm.) Borges., *Ulva pertusa* Kjellm.—No. 5 contains *Thorea ramosissima* Bory, *Bangia fuscopurpurea* (Dillw.) Lyngb., *Erythrophyllum Gmelini* (Grun.) Yendo, *Scinaia Cottonii* Setch., *Tylotus lichenoides* Okam. n. sp., *Rhabdonia robusta* J. Ag. *Caulerpa scalpelliformis* (R. Brown) Ag. var. *denticulata* (Descen.) Weber.—*Author.* (Courtesy Japanese Jour. Bot.)

1570. OKAMURA, KINTARÔ. *Icones of the Japanese algæ.* Vol. 4<sup>6-7</sup>. P. 109-149. 10 col. pl. (Explanations in English and Japanese.) Tôkyô, 1921.—No. 6 contains *Halymenia*

*dilatata* Zanard., *Sarcodia Montagneana* (H. & H.) J. Ag., *Champia expansa* Yendo, *Ceramium tenerrimum* (Mart.) Okam., *C. paniculatum* Okam., *Dilsea edulis* Stackh.—No. 7 contains *Pikea californica* Harv., *Gymnogongrus flabelliformis* Harv., *Euptilota articulata* Schm., *Asparagopsis hamifera* (Hariot) Okam., *Chrysomenia Uvaria* (L.) J. Ag., *Pterosiphonia bipinnata* (P. & R.) Falkenb., *P. articulata* (J. Ag.) Setch. and Gardn.—Author. (Courtesy Japanese Jour. Bot.)

1571. OKAMURA, KINTARÔ. *Icones of Japanese algæ*. Vol. 4<sup>8-9</sup>. P. 152-184. 10 pl. (Explanations in English and Japanese.) Tôkyô, 1922.—No. 8 contains *Rhodomela subfusca* (Woodw.) C. Ag., *Nemalion multifidum* (W. & M.) J. Ag., *Rhodomela Larix* (Turn.) C. Ag., *Roschera glomerulata* (C. Ag.) Web. v. Bosse, *Antithamnion Plumula* (Ellis) Thur., *Chondrococcus Hornemanni* (Mert.) Schmitz, and *Chondrococcus japonicus* (Harv.) Okam.—No 9 contains *Ahnfeltia concinna* J. Ag., *Delesseria Middendorffii* Rupr., *Laurencia pinnatifida* (Gm.) Lam., *Laurencia obtusa* (Huds.) Lam., *Sporochnus radiciiformis* (R. Br.) C. Ag., and *Sporochnus scoparius* Harv.—Author. (Courtesy Japanese Jour. Bot.)

1572. OKAMURA, KINTARÔ. *Report of the experiments on the propagation of Ceramium hypnæoides*. (Japanese.) Rept. Imp. Fisheries' Inst. Tôkyô 18: 1-20. 1 pl. 1922.—The mode of propagation of *Ceramium hypnæoides* (J. Ag.) Okam was made the object of study by the author for the purpose of promoting it. Though in this species the presence of tetraspores was known, carpospores had not yet been observed. The author discovered the formation of the latter, and found that they never germinate upon rocks, but always upon the branches of some species of *Sargassum*. Their germination occurs between the last part of September and the first part of October. The plant forms its carpospores the following summer, and then perishes. Though formerly this species was known by the name, *Campylæphora hypnæoides* J. Ag., the author thinks it more reasonable to place it under the genus *Ceramium*; the discussion on the latter subject will be published in another paper.—Author (Courtesy Japanese Jour. Bot.)

1573. OLTMANN, FRIEDRICH. *Morphologie und Biologie der Algen. Chrysophyceae-Chlorophyceae*. 2nd Ed. Bd. 1, VI + 459 p., fig. 1-287; Bd. 2, IV + 439 p., fig. 288-612. Gustav Fischer: Jena, 1922.—Volume 1 of this 2nd rewritten edition of the monograph covers the algae comprised under the following main groups: Chrysophyceae, Heterocontae, Cryptomonadales, Euglenaceae, Dinoflagellata, Conjugatae, Bacillariaceae, and Chlorophyceae. A short section on the Charales is added.—The 2nd volume covers the Phaeophyceae and Rhodophyceae. The 3rd, it is stated, will take up general questions.—Frederick V. Rand.

1574. OYE, PAUL VAN. *Note sur l'Euglena acus Ehrenberg*. Bull. Soc. Roy. Bot. Belgique 56: (1-9). 4 fig. 1924.—The writer gives evidence that *Phacus acutissimus* Bernard and *Euglena acutissima* Lemmermann are merely synonyms of *Euglena acus* Ehrenberg, which undergoes considerable change in form, dimensions, and appearance during its life history. *E. acus* Ehr. emend. van Oye is described, further, to include the young stages previously known under the varietal names of *minor* Hansgirg and *rigida* Huebner.—L. H. Tiffany.

1575. PAGE, IRVINE H. *Algae—their significance and determination in water supplies*. Proc. 16th Ann. Convention Indiana Sanitary and Water Supply Assoc. 1923: 59-65. 1923.—The author cites the occurrence of *Synura* in a Boston water supply producing an unpleasant cucumber odor in the water. The method of examination given in Whipple's "Microscopy of drinking water" is advocated.—Since green plants utilize CO<sub>2</sub>, liberating O<sub>2</sub> as a by-product in photosynthesis, waters with abundant algal growth often contain dissolved O<sub>2</sub> in large amount. Graphs show the rise in dissolved O<sub>2</sub>, correlated with the presence of green algae, in the White River below Indianapolis. Algae will sometimes obtain CO<sub>2</sub> from dissolved bicarbonates, thus making the water alkaline to phenolphthalein.—For treatment of water containing troublesome algae the author records Moore and Kellerman's CuSO<sub>4</sub> method. This must be preceded by microscopical examination in order to determine just what algae are present, and the amount of CuSO<sub>4</sub> to be used. *Scenedesmus*, for example, requires 2.5 pounds per million gallons of H<sub>2</sub>O, while *Anabaena* needs only 0.8 pound.—Algal growth is frequently sufficient to clog filters, and lack of control leads to unpleasant taste, bad odor, and unsightly discolorations of the water. Laboratory examination, recording relative amounts of the various



classes of algae, protozoa, and amorphous matter, is of undoubted value in the handling of water supplies.—*W. C. Purdy. [Public Health Engineering Absts.]*

1576. PIA, J. Geologisches Alter und geographische Verbreitung der wichtigsten Algen-gruppen. [Geologic age and geographic distribution of the important groups of Algae.] Oesterreich. Bot. Zeitschr. 73: 174–190. 1924.—The writer distinguishes ancient, old, and young forms. To the ancient forms belong the Schizophyceae, a group more or less independent of the temperature of its habitat. The old forms, embracing the Coccolithophorae, Codiaceae, and Dasycladaceae, are mostly found in the tropics, and in temperate waters. Of the young forms, the Diatoms are mostly found in cold water; the Corallinaceae, around the equator. The latter, however, often extend into colder zones.—*Ernst Artschwager.*

1577. POCHÉ, F. Über einige angebliche Systematische Neuerungen in der vierten Auflage von Dofleins Lehrbuch der Protozoenkunde. [Some ostensible systematic innovations in the fourth edition of Doflein's "Lehrbuch der Protozoenkunde."] Arch. Naturgesch. Abt. A 89: 20–24. 1924.—Attention is called to Doflein's failure to give due credit for certain ideas concerning classification which he propounds as original.—*C. E. Allen.*

1578. SAUVAGEAU, CAMILLE. A propos de quelques Fucus du Bassin d'Arcachon. [Some Fucus species of the Bassin d'Arcachon.] Bull. Sta. Biol. d'Arcachon 20: 19–136. Fig. 1–24. 1923.—This memoir is in continuation of a study, "Sur deux Fucus récoltés à Arcachon (*Fucus platycarpus* et *F. lutarius*)", published in this Bulletin in 1908. Its 4 chapters discuss, respectively, (1) *Fucus platycarpus* Thuret; (2) *F. dichotomus* Sauv. (its stations, general appearance, condition of the plant at different seasons and diagnosis—original description of the species appeared in Compt. Rend. Acad. Sci. 160: 1915; (3) *F. lutarius* Kützinger (in Iles Chausey, recent English investigations, conclusions and probable affinities, and diagnosis); (4) *F. vesiculosus* L. a discussion of Stomps' views upon the variability of *Fucus*; *F. axillaris* J. Agardh (from the herbarium of J. Agardh), its varieties *spiralis* J. Agardh and *divaricata* J. Agardh thrown upon the shore at the Bay of Cadix, comparison of *F. axillaris* and *F. vesiculosus*; and *F. vesiculosus* at Cape Ferret.—*Frederick V. Rand.*

1579. SECKT, HANS. Estudios hidrobiológicos en la Argentina. Flagellatae. [Hydrobiological studies in Argentina. Flagellatae.] Bol. Acad. Nacion. Cienc. [Argentina] 25: 430–490. Fig. 1–94. 1922.—The author regards the group of plants which he names "mastigophytes" as the survivors of a type of organisms that were more highly developed in the remote past and whose branches have since become divergent. The Mastigophyta are divided into Flagellatae, Dinoflagellatae, and Silicoflagellatae. The species found are described and illustrated. A 4-page bibliography is appended.—*Edith K. Cash.*

1580. SECKT, HANS. Estudios hidrobiológicos en la Argentina. Schizophyceae. [Hydrobiological studies in Argentina. Schizophyceae.] Bol. Acad. Nacion. Cienc. [Argentina] 25: 383–429. Fig. 1–47. 1922.—The plants described were found in connection with studies of the planktonic organisms collected in the vicinity of Buenos Aires.—*Edith K. Cash.*

1581. SJÖSTEDT, GUNNAR. Biologiskt-botaniska undersökningar av Öresund. II. En vegetationsfärgning av Nodularia spumigena i Öresund jämte biologisk översikt över övriga marina baltiska planktonfärgningar. [Coloring of the water in Öre Sound by Nodularia spumigena and an ecological survey of other Baltic plankton discolorations.] Lunds Univ. Aarskr. Adv. 2. 18<sup>2</sup>: 1–25. Fig. 1–3. 1922 [1923].—In an excursion, Sept. 18, 1921, in Öre Sound between the island of Hven and the coast, a coloring of the water due to *Nodularia spumigena* was observed. This algal form was most abundant in the surface water, the number of algal cells in this surface layer being estimated at 3,900,000 per l. The coloring of the water seemed to include the whole sea lane between Hven and the coast and from Bäckvik southward for at least 2 "Distanzminuten." A rising wind and the consequent disappearance of the discoloration made further investigation of the phenomenon impossible.—In addition to the description of this Nodularia-coloration, the author gives a summary of all the hitherto known marine algae of the Baltic Sea region occurring in sufficient quantities to discolor the water. From this summary and the biological evidence given it follows that the appearance and spread of these plankton organisms depend not so much upon variations in the salt content as on the organic nutrient content of the water. This statement seems also to apply to a large number of other marine organisms, animal as well as plant. The nutrient-physiological relation of the water,

and more particularly the N and pH content, seems, in general, to be the limiting factor in the distribution of marine organisms. Water rich in nutrients seems to favor particularly the Schizophyceae and the Chlorophyceae. For most marine algae, on the contrary, a water rich in nutrients acts unfavorably. This is especially true for the Rhodophyceae, less so for the Phaeophyceae.—In this connection the author calls to mind the fresh water and various drainage waters entering the Baltic Sea, conditions which surely must be not only of local significance but must also have a great influence upon the Baltic Sea water as a whole, and therefore on its entire animal and plant content. (*From German summary.*)—Frederick V. Rand.

1582. TIFFANY, L. H. Some new forms of *Spirogyra* and *Oedogonium*. Ohio Jour. Sci. 24: 180–187. Pl. 1–3. 1924.—Latin and English descriptions are given of several new species or varieties collected in Iowa or Ohio: *Spirogyra echinata* with the median spore wall prominently echinate; *S. pellucida* Kuetz. var. *minor*, smaller than the type; *Oedogonium iowense* with fruiting cells 3–6 times the diameter of the vegetative cells; *O. latiusculum* with capitate vegetative cells, subhemispherical basal cell, operculate oogonium, and dioecious habit; *O. infimum* with the division of the operculate oogonium basal; *O. exspirale*, small and idio-androsporous; *O. supremum* with operculate division at the upper extremity of the oogonium; *O. grande* Kuetz.; Wittr. var. *robustum* (Hirn) n. comb.—H. D. Hooker, Jr.

1583. WETTSTEIN, FRITZ VON. Zur Bedeutung und Technik der Reinkultur für Systematik und Floristik der Algen. [The meaning and technique of pure culture methods in systematic and floristic studies of the Algae.] Oesterreich. Bot. Zeitschr. 70: 23–29. 1921.—The author points out the great need for pure culture studies of the algae in problems of taxonomy and of plant distribution. The classification of many forms is uncertain unless the complete life cycle is known. When specimens are collected in the field some are so damaged by the preserving fluid that identification is difficult or impossible. Two culture media are described. One contains mineral nutrients alone while the other also has a peat decoction. Agar, not over 1%, is added so that the medium does not solidify. The author's method is to take the medium into the field in bottles and to place in it the material collected. On returning to the laboratory the jelly is poured into plates. The forms develop in colonies which can be transferred to other plates. It is often difficult to separate them from bacteria but for most purposes this is unnecessary.—T. D. Howe.

## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 1169, 1466, 2076, 2090)

1584. САВИЧ, ЛИДИЯ [SAVICH, LYDIA]. Новый вид мха из редкого рода *Haplohymenium* Doz. et Molk. [A new species of *Haplohymenium*.] (Russian, with a Latin description.) Ботанические материалы Института Словесных Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 1: 97–102. 1922.—The new species here described, *H. flagelliforme*, is compared with *H. piliferum* Broth. It is based on material collected by A. A. Bulawkina at Frolowka in the southern part of the Ussuri Province in southeastern Siberia.—A. W. Evans.

1585. САВИЧ, ЛИДИЯ. [SAVICH, LYDIA.] Список мхов южно-уссурийского Края. [Enumeration of the mosses of South Ussuri.] (Russian with a German résumé.) Acta Horti Petropolitani 39: 129–160. (Reprint 32 p.) Petrograd, 1923.—The report is based on a collection of bryophytes made in 1913 by W. L. Komarow and A. A. Bulawkina in the southern part of the Ussuri Province of southeastern Siberia. The species listed include 5 hepatics, 3 peat mosses and 65 true mosses. Each is accompanied by full data regarding stations, and many critical notes are interspersed. Aside from *Haplohymenium flagelliforme* and *Thuidium Komarowii*, 2 species recently proposed as new by the author [for the 1st, see preceding entry], several of the species in the collection are of interest from the standpoint of geographical distribution. In a review of the scanty bryological literature dealing with the region under



consideration, attention is called particularly to a little-known paper by Regel and Maack, published in 1861, in which *Mnium ussuriense*, a species allied to *M. stellare*, was described as new. In the absence of the type-specimen it is impossible to interpret this species at the present time.—A. W. Evans.

1586. Савич, Лидия. [SAVICH, LYDIA.] Мох *Hypopterygium* в оранжереях главного Ботанического Сада. [*Hypopterygium* in the greenhouses of the Petrograd Botanical Garden.] (Russian, with a Latin résumé.) Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 1: 110-112. 1922.—The discovery of *H. Balantii* C. Müll. in the greenhouses of the botanical garden at Petrograd is announced. The species grew on the trunks of tree ferns and has been found in similar localities at Berlin and Paris.—A. W. Evans.

1587. Савич, Лидия. [SAVICH, LYDIA.] Список мхов Архангельской губернии. [List of bryophytes of the Archangel province.] (Russian, with a French résumé.) Известия Главного Ботанического Сада Р. С. ф. С. Р. [Bull. Principal Jard. Bot. Republ. Russe] 20: 25-33. 1921.—The author gives a list of 69 bryophytes, collected for the most part in the vicinity of Archangel, Russia, by V. P. Savich. The list includes 11 hepatics, 7 peat mosses and 51 true mosses, each species being accompanied by data regarding stations.—A. W. Evans.

1588. Савич, Лидия. [SAVICH, LYDIA.] Заметка о мхе *Leucobryum glaucum* (L.) Schimp. и его разновидности var. *pulcherrimum* Lyd. Savich nom. nov. [Note on the moss *Leucobryum glaucum* (L.) Schimp. and its var. *pulcherrimum* Lyd. Savich.] (Russian, with a Latin description.) Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 1: 56-60. 1922.—The author brings out the fact that *Leucobryum glaucum* var. *gracile* Ljubitz., which she described as new in 1914 on the basis of material from Italy and the Caucasus, is distinct from *L. glaucum* f. *gracile* Wint., dating from 1910. She therefore gives her variety the new name *pulcherrimum*.—A. W. Evans.

## MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*  
D. S. WELCH, *Assistant Editor*

(See also in this issue Entries 1104, 1142, 1169, 1191, 1209, 1215, 1225, 1353, 1362, 1459, 1568, 1663, 1681, 1689, 1764, 1773, 1868, 1870, 1885, 1912, 1934, 1935, 1936, 1943, 1967, 2029, 2090)

### FUNGI

1589. ANDERSON, H. W. New species of fungi from Illinois. Illinois Acad. Sci. Trans. 15: 126-129. 1922.—The new species are *Septoria collinsiae* on *Collinsia verna*, *S. septentrionalis* on *Ranunculus septentrionalis*, *Gloeosporium Impatiensis* on *Impatiens biflora*, *Phyllosticta Rafinesquii* on *Viola Rafinesquii*, and *Ascochyta Rhodotypi* on *Rhodotypos kerrioides*.—Author.

1590. BERKHOUT, CHRISTINE MARIE. De Schimmel geslachten *Monilia*, *Oidium*, *Oospora* en *Torula*. [The fungus genera *Monilia*, *Oidium*, *Oospora*, and *Torula*.] 71 p. 4 pl. (Doctors thesis. Univ. of Utrecht.) Edauw & Johannissen: Scheveningen, 1923.—This study includes all species of which authentic material was available. Their morphological characters were compared from 3 weeks' old cultures grown on wort agar. The physiological characters were studied on different media. Fermentation reactions were tested in wort and several sugar solutions, the preferred method being that of Burri in which a test tube open at both sides and corked at the bottom incloses a movable agar column to register the amount of gas formed. The following proposed systematic arrangement is based primarily on morphological differences:—*Monilia* Gmelin. (Persoon 1801 emend. Sacc. 1880). Conidia medium sized, lemon-shaped, catenulate; conidiophores unbranched or dichotomously branched; hyphae long, giving cottony appearance. Including parasitic (lacking fermentative power) and

saprophytic species, *M. aurea* and *M. sitophila* (causing fermentation in sugar solutions).—*Candida* n. gen. Small oval to globose conidia arising by budding from reduced hyphae or from each other; the cells of the few hyphae formed tending to fall apart; yeast-like in appearance; all species fermenting glucose. The genus includes *Monilia candida* Bonorden, a yeast-like form introduced into the literature as a yeast by Hansen, and followed by a series of similar species found in the yeast industry and in the human body (throat and lungs).—*Oidium* Link. emend. Sacc. 1880 with Engler's diagnosis, contains only the conidial stages of the Erysiphaceae.—*Oospora* Wallroth 1833, emend. Sacc. 1880. Oval to globose conidia formed in chains or resulting from the breaking up of the hyphae at the septa; mycelium cottony in aspect. Although *O. lactis* does not ferment sugars, a few of the species included do. Many species occur in nature on decaying wood. The genus *Sachsia* is incorporated here.—*Torula* Persoon 1822, emend Sacc. 1880. Conidia dark, catenulate; conidial bearing hyphal branches short, not differentiated as definite conidiophores; mycelium creeping; not yeast-like in aspect. The white and red *Torulas* of the yeast industry not included here.—*Dematium* Persoon 1797 with Engler's diagnosis.—*Pullularia* n. gen. Erected to include *Dematium pullulans* de Bary & Löw. where erect conidiophores and catenulate conidia are lacking; conidia medium sized, oval, light colored, arising by budding from the dark colored hyphae, very rarely absent; hyphae composed of large, dark, thick-walled cells; cottony to yeast-like in appearance, colonies dark with lighter edges, sometimes remaining light colored; not fermenting sugars; *Monilia fusca* placed here and suggestion made that *Sarcinomyces crustaceus* Lindner be included also.—The genus *Endomyces* Lindner is divided by Guilliermond into 2 types: (1) with budding conidia, (2) with oidia. The genera *Candida* and *Oospora* represent the 2 types, respectively.—*Author*.

1591. BOSE, S. R. Three new species of Bengal Polyporaceae. Bot. Caz. 78: 119-121. Fig. 1-3. 1924.—The following species, all occurring on dead wood, are described: *Polyporus Guhae*, *Trametes Karii*, and *Favolus Bengala*.—B. W. Wells.

1592. BRITTELBANK, C. C., AND D. B. ADAM. A new disease of gramineae: *Pleosphaeria semeniperda* Nov. sp. Trans. British Mycol. Soc. 10: 123-127. Pl. 8-9. 1924.—A disease of wheat and oats resembling "take-all" was found to be due to a species of *Pleosphaeria* which is described in detail and named *P. semeniperda*.—W. B. McDougall.

1593. CARNAHAN, MARY. Some polypores in Henry County. Proc. Iowa Acad. Sci. 30: 365. 1923.—Nineteen species as identified by W. A. Murrill are listed.—H. S. Conard.

1594. DEMELIUS, PAULA. Konidienbildung bei *Boletus bovinus* Kr. [Formation of conidia in *B. bovinus*.] Verhandl. Zool.-Bot. Ges. Wien 71: 111-112. 1 fig. 1922.—Conidia corresponding in form, color, and size with the basidiospores were found in definite spots on the upper surface of the pileus, where they were borne terminally on the ordinary hyphae.—H. M. Fitzpatrick.

1595. DOIDGE, E. M., AND E. J. BUTLER. The cause of citrus scab. Trans. British Mycol. Soc. 10: 119-121. Fig. 1. 1924.—The fungus causing citrus scab is described and named *Sporotrichum Citri*.—W. B. McDougall.

1596. FALCK, R. Von Höhnel's mykologische Arbeiten. [Mycological works of v. Höhnel.] Falck's Mykolog. Untersuch. u. Ber. 1: I-VI. 1923.—A complete list is given of the papers published by VON HÖHNEL on the fungi, arranged by journals.—H. M. Fitzpatrick.

1597. GONZÁLEZ FRAGOSO, ROMUALDO. Contribucion a la flora micológica Lusitánica. [Contribution to the mycological flora of Portugal.] Bol. Soc. Broteriana. 2 Ser. 2: 1-83. Fig. 1-3. 1924.—Approximately 300 species are listed with notes. A muriform-spored genus of the Lophiostomataceae, *Sampoioa*, based on *S. pinastri* n. sp. and the following additional species are described as new.—*Puccinia avenae-barbatae*, *Didymella kraunhiae*, *Leutomitia quercina*, *Leptosphaeria anarrhini*, *L. foeniculi*, *Physalospora sampaioi*, *Sphaerella quercifolia*, *Nectria Sampaioi*, *Nectriella lusitanica*, *Gloniella Sampaioi*, *Comesia Sampaioi*, *Dyctiosporium castaneum*, *Fusarium, sampaioi*, *Cylindrosporium cameliae*, *Colletotrichum glycines*, *C. Palkin-hae*, *Pestalotzia lusitanica*, *Ascochyta dolichi*, *Camarosporium piricola*, *Coniothyrium eucalypti*, *Cytosporina salicis*, *Diplodia brassicae*, *Dothiorella kraunhiae*, *Fusicoccum cheirantheri*, *Hendersonia acaciae*, *H. sarmentorum*, *Macrophoma aquilegiae*, *Phoma anarrhini*, *P. astrocarpi*, *P. fabae*, *P. rumicis*, *Phyllosticta coniothyrioidea*, *Phyllosticta ilicis*, *Phyllosticta*



*platani-acerifoliae*, *Phyllosticta sampaioana*, *Rhodospora anarrhini*, *R. sampaioi*, *Septoria bromi*, *S. coleostephi*, *Discosia sampaioi*, *Leptostromella fabae*, *Leptothyrium henriquesianum*. A new variety, *Barlaea astroidea* var. *lichenicola* is also described.—*H. M. Fitzpatrick*.

1598. GONZÁLEZ FRAGOSO, ROMUALDO. *Hongos de Jardín Botánico de Madrid*. [Fungi of the Botanical Garden of Madrid.] *Bol. R. Soc. Española Hist. Nat.* 23: 315-329. 1923.—The following are described as "species nova ad interim."—*Phoma Ephedrae*, *P. Iberidis*, *P. gracciae*, *P. Puerariae*, *P. Teucrii*, *Ascochyta Rhagodiae*, *A. yuccaeifoliae*, *Diplodina Dioscoreae*, *D. Yuccae*, *Rhodospora Iberidis*. The following are described as "species nova,"—*Camarosporium Bignoniae*, *Septoria Iberidis*, *Leptostroma Dioscoreae*, *Macrosporium Dioscoreae*, *Pleospora excelsa*. The following are described as new varieties or new forms, *Vermicularia trichella* Fr. f. *caulicola*, *Hendersonia sarmentorum* West var. *tataricae* and var. *Rhoina*, *Camarosporium Rhagodiae* Tassi f. *spinicentis*, *Epicoccum granulatum* Penz. var. *microspora*, *Cercospora Callae* Peck & Clinton f. *aethiopica*.—*H. M. Fitzpatrick*.

1599. GONZÁLEZ FRAGOSO, ROMUALDO. *Nueva serie de Hongos del Herbario del Museo de Ciencias Naturales de Barcelona*. [New series of fungi in the herbarium of the Museum of Natural Sciences, Barcelona.] *Bull. Inst. Catalana Hist. Nat.* 2nd Ser. 3: 116-122. Fig. 1. 1923.—An enumeration of fungi of various groups is given. A single new species *Septoria fontii*, is described and figured.—*H. M. Fitzpatrick*.

1600. GONZÁLEZ FRAGOSO, ROMUALDO. *Ustilagales de la flora española existentes en el Herbario del Museo Nacional de Ciencias Naturales de Madrid*. [Ustilaginales of the Spanish flora in the herbarium of the National Museum of Natural Science, Madrid.] *Bol. R. Soc. Española Hist. Nat.* 24: 116-127. 1924.—This consists of an annotated list of approximately 60 species.—*H. M. Fitzpatrick*.

1601. HÖHNEL, FRANZ V. *System der Fungi Imperfecti Fuckel*. [Classification of the Fungi Imperfecti.] *Falk's Mykolog. Untersuch. u. Ber.* 1: 301-369. 1923.—A new system of classification for the Fungi Imperfecti is proposed. The group is subdivided into Histiomyceten, Synnematomyceten, and Hyphomyceten. The sub-divisions of the 1st 2 groups are given, including a key to the genera, which total 599; the Hyphomyceten are not covered.—*H. M. Fitzpatrick*.

1602. KIDD, M. N., AND A. BEAUMONT. *Apple rot fungi in storage*. *Trans. British Mycol. Soc.* 10: 98-118. Pl. 6-7. 1924.—This paper is based on a systematic investigation of all rots that developed on certain groups of apples during 2 storage seasons. A total of 1795 isolations were made and 47 different species of fungi were identified. Inoculations from single spore cultures of most of these fungi were made on healthy apples to establish their pathogenicity. The following species of fungi are described as new: *Phoma fuliginea*; *P. Bismarckii*; *Oospora Mali*; *Cephalosporium Malorum*; *Hyalopus albidus*; *Sporotrichum Malorum*; *Tilachlium cinnabarinum*; *Graphium Malorum*. *Coryneum microstictum* Berk. and Br. var. *Mali* is described as a new variety.—*W. B. McDougall*.

1603. LOHWAG, H. *Entwicklungsgeschichte und systematische Stellung von Secotium agaricoides* (Czern.) Holl. [Development and systematic position of *Secotium agaricoides*.] *Oesterreich. Bot. Zeitschr.* 73: 161-174. Pl. 2. 1924.—*Secotium agaricoides* is a true Gymnomyces and closely related to the Phallaceae. The genus *Elastomyces* is to be separated from *Secotium*.—*Ernst Artschwager*.

1604. McDOUGALL, W. B. *Notes on Illinois mushrooms*. *Trans. Illinois State Acad. Sci.* 15: 121-125. Fig. 1-4. 1922.—Notes on *Crepidotus cinnabarinus*, *Pleurotus subpalmatus*, *Secotium agaricoides*, *Amanitopsis adnata* var. *alba*, and *Phallus impudicus* are included, together with photographs of the species.—*H. W. Anderson*.

1605. NAGANISHI, HIROSUKE. *Investigation of the fermentation organisms of Awamori*. (Japanese.) *Mitteil. Zentr. Untersuchungsanst., Südmandschur. Eisenbahnges.* 6: 145-224. 1921.—After a detailed discussion of methods the author lists the following species found in Koji and Moromi: I. Molds. (1) Ascomycetes: *Aspergillus Awamori* Nakazawa, *A. perniciosus* Inui, *A. clavatus* Desm., *A. fumigatus* Fres., *Penicillium purpurogenum* Stoll, *Penicillium a*, *b*, *c*, *d*. (2) Phycomycetes: *Rhizopus tonkinensis* Vuillemin, *R. chinensis* Saito. (3) Fungi imperfecti: *Oospora lactis* Sacc., *O. lupuli* Mat. & Lott., *Monilia* 1 & 2.—II. Yeasts. *Saccharomyces Awamori* Inui, *Willia anomala* Hansen, *Pichia membranaefaciens* Hansen, *P.*

*farinosa* Lindner, *Torula* sp., filamentous yeasts I, II, III.—III. Bacteria. *Bacillus mesentericus vulgatus* Flügge, *Pediococcus* sp.—The optimum activity of the diastase of *Aspergillus Awamori* for starch liquefaction occurs at pH3; for changing starch to sugar, at pH4–4.4. The author also found that this diastase acts with special avidity on the starches of sorghum and maize.—K. Saito. (Courtesy Japanese Jour. Bot.)

1606. OVEREEM, C. VAN, UND J. WEESE. *Icones Fungorum Malayensium Abbildungen und Beschreibungen der Malayischen Pilze*. Pt. 1–4. Clavariaceae. [Figures and descriptions of Malay fungi.] Pl. 1–4. 8 p. Mykol. Mus. Weesp [Holland] 1923.—This publication is appearing at intervals, and can be purchased through Martinus Nijhoff, The Hague. Four parts have appeared; each consists of a single colored plate accompanied by a descriptive text in German. The work is expected to illustrate fungi of the Dutch East India Archipelago. The species treated thus far include: *Phaeoclavulina Zippelii* (Lév.) v. Overeem, *Clavaria implexa* Lév. *Clavariella fragillima*, (Hennings) v. Overeem *Clavulina Leveillei* (Sacc.) v. Overeem, *C. umbrina* (Lév.) v. Overeem, *C. fusco-lilacina* (Berk.) v. Overeem, *Clavulinopsis sulcata* v. Overeem, *Clavaria subaurantiaca* Hennings & Nyman, *C. fusiformis* Fr., *C. rosacea* Hennings, *C. depokensis* v. Overeem, *C. luteo-tenerrima* v. Overeem, *C. fumosa* Fr., *filiformis* Hennings & Nyman, *C. sanguinea-acuta* v. Overeem, *C. vermicularis* Fr., *C. alvicornis* Zollinger & Moritz, *C. vermiculata* Micheli, *C. Zollingeri* Lév.—H. M. Fitzpatrick.

1607. PETCH, T. Studies in entomogenous fungi. IV. Some Ceylon Cordyceps. Trans. British Mycol. Soc. 10: 28–45. Pl. 1, fig. 3. 1924.—The following species are described as new: *Cordyceps Blattae*; *C. translucens*; *C. pruinosa*. A number of other species of *Cordyceps*, *Isaria*, *Hirsutella* and *Gibellula* are described and discussed.—W. B. McDougall.

1608. PETCH, T. Studies in entomogenous fungi. V. Myriangium. Trans. British Mycol. Soc. 10: 45–80. Pl. 2–3, fig. 1. 1924.—The genus *Myriangium* is discussed in detail from historical, structural and systematic viewpoints. *Myriangium Thwaitesii* is described as new.—W. B. McDougall.

1609. RAEDER, J. M. Studies of the Phycomycetes of Iowa. Proc. Iowa Acad. Sci. 28: 283–291. 1921.—This is a list, with localities, of the Phycomycetes of the herbarium of the Iowa State College, together with published lists. A summary is given of work in the state by Halsted, Bessey, Arthur, Hitchcock, Holway and Pammel.—H. S. Conard.

1610. ROBERTS, JOHN W. Morphological characters of *Alternaria mali* Roberts. Jour. Agric. Res. 27: 699–708. 2 pl., 1 fig. 1924.—A detailed description is given of *Alternaria mali*, formerly briefly described by the author and claimed by him to cause a characteristic enlargement of spots on apple leaves. Variants considered as due to mutation were found in "single spore" cultures. Certain characters common to several members of the genus *Alternaria* are discussed. The so-called "isthmi" or beaks are regarded as conidiophores and were not included in measurements.—Author.

1611. SAITO, KENDO. Untersuchungen über die atmosphärischen Pilzkeime. III. Mitteil. [Investigation of aerial germination of fungi.] Japanese Jour. Bot. 1: 1–54. 3 pl. 1922.

1612. SAWADA, KANEYOSHI. Can *Exobasidium vexans* Mass. bear conidia besides the basidiospores? Trans. Nat. Hist. Soc. Formosa 59: 1–7. 1922.—The blister blight (*Exobasidium vexans* Mass.) is an epidemic disease of tea plants well known in India. In Japan proper and in Formosa the same disease as well as a similar one due to an allied fungus (*Exobasidium reticulatum* Ito and Sawada) are met with. Massee thinks that *E. vexans* produces, besides ordinary unicellular basidiospores, 2-celled conidia each of which is seated singly at the apex of a short hypha. McRae's observations agree perfectly in this respect with those of Massee. The author has followed the development of the basidiospores on Formosan specimens of *E. vexans*. According to his observations each basidiospore, after having fallen off, becomes first of all 2-celled; of such basidiospores, some soon germinate, while others which fail to germinate become apparently thick-walled. The 2-celled spores of the latter kind are, according to the author's measurement,  $11-16 \times 4-6\mu$ —very similar in size to the so-called bicellular conidia of Massee and of McRae, given as  $14-16 \times 5-6\mu$  and  $12-21 \times 4.5-6\mu$ , respectively. On the basis of the observations just quoted as well as his studies on *E. reticulatum* and *E. Machili* Sawada the author comes to the conclusion that the statement of Massee that



*E. vexans* bears conidia besides basidiospores is unwarranted.—*S. Ikeno*. (Courtesy Japanese Jour. Bot.)

1613. SIEMASZKO, W. *Badania mykologiczne w górach Kaukazu*. [Mycological investigations in the Caucasus Mountains.] Prace Zakładu Fytopathologicznego Szkoły Główniej Gospodarstwa Wiejskiego I [Phytopathological Institute of the Agricultural High School, Skierniewice, Poland, Contribution I.] 57 p. Archiwum Nauk Biologicznych Towarzystwa Naukowego Warszawskiego 14: (57 p.) 1923.—A general discussion of the investigations is followed by a list of nearly 500 fungi collected. The following species are given as new. *Taphrina Athyrii*, *T. Struthiopteridis*, *Phyllosticta Centaureae*, *P. Chenopodii albi*, *P. Impatiensis*, *Ascochyta Betonicae*, *A. Alni*, *A. Farfarae*, *A. frazinifolia*, *A. geraniicola*, *A. Saccardoii*, *A. Verbenae*, *A. Woronowiana*, *Staganocephala Hesperidis*, *Diplodia Atropae*, *Staganocephala Marssonii*, *S. Mulgedii*, *S. physalina*, *S. Thalictri*, *Hendersonia Emiliae*, *Camarosporium Asplenii*, *Rhabdospora Digitalis*, *R. Hieracii*, *Leptothyrium Laurocerasi*, *Melasmia Pedicularis*, *Colletotrichum Alni*, *C. Ajungae*, *Marssonium Erythraeae*, *Microstroma Melandryi*, *Ramularia Albowiana*, *Ramularia Senecionis-platyphylli*, *Ramularia caucasica*, *Cercospora Astrantiae*, *C. Struthiopteridis*, *C. Valerianae*, *C. Woronowii*, *Cercospora abchozica*, *C. knautiae*, *C. Pteridis*, *C. Ramularia*. A French résumé of the introductory pages is given. Certain anomalous developments are reported, for example, occurrence of mesospores in several species of *Puccinia*, anastomosis of spores, formation of spores in chains, and development of microconidia in *Cercospora*.—*H. M. Fitzpatrick*.

1614. SIEMASZKO, W. *Grzyby Puszczy Białowiezkiej*. [Fungi Bialowiezenses Exsiccati. Century I.] Prace Zakładu Fytopathologicznego Szkoły Główniej Gospodarstwa Wiejskiego II. [Phytopathological Inst. Agric. High School, Skierniewice, Poland, Contrib. II.] 27 p. Editio Mus. Hist. Nat. Bialowieza: Poloniae, 1923.—This is an enumeration of the fungi distributed, with data of collection. On No. 90, *Cercospora filicis-feminae* (Bresadola) Siemaszko n. nom. replaces *Cylindrosporium filicis-feminae* Bresadola.—*H. M. Fitzpatrick*.

1615. SIEMASZKO, W. *Notatki Grzyboznawczo-Geograficzne*. [Mycogeographical notes.] Acta Soc. Bot. Poloniae 2: 1-9. 1924.—In spite of the cosmopolitan distribution so strikingly exhibited by fungi, this group of plants includes many forms which are peculiar to different countries. It follows that fungi may be used along with phanerogams in characterizing a country from a phytogeographical standpoint. The mycological flora of Poland is directly connected with that of Central and Western Europe. For example, the author has found near Wilno, *Microsphaera alni* Wint. f. *quercina* Neg. which is not present in Eastern Europe. In 1923, *Queletia mirabilis* Fr. was found near Varsovie; until that time it had been known only in France. Characteristic species of Central and Western Europe are abundant in the forest of Bialowieza; for example, *Microthyrium litigiosum* Sacc. on *Pteridium aquilinum*, *Rhizosphaera Pini* Maubl. on *Abies Alba*, *Pilacre faginea* B. et Br., etc. Some are found as far north as Wilno, as *Isaria lecanicola* Jaap. on *Lecanium*. Species native to Southern Europe are also found in Poland. Thus, in the eastern Carpathians, the author has found *Trichothyrium alpestre* Thein. on *Carex sempervirens* and *Pinus pumilo*. This had hitherto been known only in the Italian Alps.—*D. S. Welch*.

1616. STEVENS, F. L. *Notes on Hawaiian botany with special reference to the fungi*. Trans. Illinois Acad. Sci. 15: 115-118. 1922.—Hawaiian botany is of especial interest on account of the extreme isolation of the islands. The flora of these islands is highly endemic, 70% of the reported species being peculiar to the region. Twelve hundred collections of fungi were made. A comparison is made with the fungous flora of less isolated regions. Rusts are relatively fewer in number than those of Porto Rico and Indiana. Smuts are represented by only 1 species.—*H. W. Anderson*.

1617. STEVENS, F. L. *Parasitic fungi from British Guiana and Trinidad*. Illinois Biol. Monogr. 8<sup>3</sup>: 7-76. Pl. 1-19. fig. 1-112. Urbana, Illinois, 1924.—The following new genera and new species are described and are to be attributed to Stevens unless otherwise indicated: in the Polystomellaceae:—*Hysterostomina palmarum* n. sp.; in the Dothideaceae:—*Coccostromopsis Plunkettii* n. gen., *C. palmigena* Plunkett n. sp., *Nowellia* n. gen., *N. guianensis* n. sp., *Leveillinopsis* n. gen., *L. palmicola* n. sp., *Amerodonthis guianensis* n. sp., *Uleodonthis paspalii* n. sp., *Achorella guianensis* n. sp.; in the Phyllachoraceae:—*Anisochora tabebuiae* n. sp.,

*Scolecodothopsis* n. gen., *S. ingae* n. sp., *Phyllachora aegiphilae* n. sp., *P. chaetochloae* n. sp., *P. dimorphandrae* n. sp., *P. guianensis* n. sp., *P. tabernaemontanae* n. sp., *P. tiliae* n. sp., *P. wisnarensis* n. sp., *Endothella anacardiacearum* n. sp., *E. tapirae*; in the Montagnellaceae:—*Haplotheceum guianensis*; in the Hemisphaeriaceae:—*Gymnopeltis* n. gen., *G. trinidadensis* n. sp.; in the Perisporiaceae:—*Meliolinopsis* n. gen., *M. palmicola* n. sp., *Hyalomeliolina* n. gen., *H. guianensis* n. sp., *Oplothecium palmae* n. sp., *Haraea mauritiae* n. sp., *Dimerium guianense* n. sp., *Mycophaga* n. gen., *M. guianensis* n. sp.; in the Perisporiaceae Imperfecti:—*Pycnodothis* n. gen., *P. tetracerae* n. sp.; in the Capnodiaceae:—*Polystomellopsis* n. gen., *P. mirabilis* n. sp.; in the Clypeosphaeriaceae:—*Stegastroma guianense*. The author gives a key to the genera of Perisporiaceae involved.—*P. A. Young*.

1618. WAKEFIELD, E. M. Windsor foray. Trans. British Mycol. Soc. 10: 1-7. 1924.—A complete list of the fungi collected, numbering about 400 species, is given.—*W. B. McDougall*.

1619. YASUDA, ATSUSHI. Drei neue Arten von Isaria. [Three new species of Isaria.] Bot. Mag. Tôkyô 35: 219-221. 3 fig. 1921.—*Isaria japonica*, *I. Cosmopsaltria* and *I. Eristalidis* are described and figured.—*S. Ikeno*. (Courtesy Japanese Jour. Bot.)

1620. YASUDA, ATSUSHI. Neue Arten von Irpex und Polyporus. [New species of Irpex and Polyporus.] Bot. Mag. Tôkyô 36: 84-87. 3 fig. 1922.—*Irpex parvulus* and *Polyporus Kanehiræ* are described and figured.—*S. Ikeno*. (Courtesy Japanese Jour. Bot.)

1621. YASUDA, ATSUSHI. Zwei neue Arten der Agariceen. [Two new species of Agaricaceae.] Bot. Mag. Tôkyô 36: 89-91. 3 fig. 1922.—*Panus japonicus* and *Armillaria gigantea* are described and figured.—*S. Ikeno*. (Courtesy Japanese Jour. Bot.)

1622. ZABLOCKI, JAN. Synchytrium Potentillae Lagerh. na skalkach ojcowskich. [Synchytrium Potentillae Lagerh. on the calcareous cliffs at Ojcow.] Acta Soc. Bot. Poloniae 2: 67-68. 1924.

## LICHENS

1623. CHEEL, E. Notes on a "coral lichen" (*Cladonia retepora*). Australian Nat. 5: 183-186. 1924.—The notes consist chiefly of citations of the localities in Australia, New Zealand and Tasmania from which the plant has been reported.—*T. C. Frye*.

1624. DARBISHIRE, O. V. Presidential address. Some aspects of lichenology. Trans. British Mycol. Soc. 10: 10-28. Fig. 1. 1924.—Nylander and Schwendener and their works are compared and contrasted. The present great need of systematic lichenology for the monographing of families, genera and even species is urged. The structure of *Peltigera canina* is discussed in some detail and the need of further anatomical work is noted. Cephalodia, soredia and isidia are defined and discussed as to structure and function. All lichens represent symbiotic associations, but this condition is certainly of polyphyletic origin and no specific type of symbiosis will apply to all lichens. The evolutionary tendency of lichens seems to be along the line of increasing to the utmost the capacity for carbon-assimilation.—*W. B. McDougall*.

1625. HUE. Monographia Crocyniarum. [Monograph of Crocynia.] Bull. Soc. Bot. France 71: 311-402. 1924.—A monograph written by M. DE LESDAIN discusses the genus *Crocynia*. A key to species is given. The following new species are described and are to be attributed to Hue: *C. antecellens*, *C. albomarginata*, *C. azurea*, *C. arenicola*, *C. brasiliensis*, *C. cespitiformis*, *C. Alicae* (*Pannaria laguinosa* Harris), *C. cerebrina*, *C. chalicophila*, *C. consociata*, *C. coriensis*, *C. cupressicola*, *C. cretica*, *C. declivicola*, *C. dissecta*, *C. disjecta* (*Lepra* sp.), *C. elegantula*, *C. filamentosa* (*Lepraria flava* Nyl.), *C. fragilissima* (*Lepraria* spp.), *C. guyanensis*, *C. galbana*, *C. humilis*, *C. Harmandi*, *C. Lesdainii*, *C. leucomelaena*, *C. lobificans* (*Lepraria lobificans* De Cr.), *C. mauritiana* (*Lepra flava* Ach.), *C. muricola*, *C. mexicana*, *C. mechistarthrica*, *C. Novae-Caledoniae* (*Lepra flava* Viel.), *C. Nipharga* (*Lecidea neglecta* Gasil.), *C. orbiculata*, *C. paupercula*, *C. pauper*, *C. permolissima*, *P. psammophila*, *C. quartzicola*, *C. reticulata*, *C. rosella*, *C. recedens*, *C. scoriicola*, *C. semicylindrica*, *C. spumosa* (*Lepraria spumosa* Duf.), *C. squalida*, *C. stolidota*, *C. sciathrapha*, *C. superba*, *C. tephra*, *C. ulmicola*, *C. urbana*, *C. Voxazii* (*Lepra aeruginosa* Harm.), *C. yunnaniana*.—The following new species are to be attributed to de Lesdain: *C. arvernica*, *C. arvernica spongiosa* n. form. (*Lepraria latebricola* Brin.), *C. Andrewii*, *C. americana*, *C. anomala*, *C. albissima*, *C. angelica*, *C. aveyronensis*, *C.*



*belgica*, *C. Bioreti*, *C. brevieri* (*Amphiloma languinosum* Brev.), *C. Brunii*, *C. crassima* (*Lepra latebrarum* Harm.), *C. Finkii* (*Pannaria languiosa* Cumm., also Merr.) *C. Fauriana*, *C. flavissima*, *C. fragilis*, *C. Gasilienii*, *C. glebulosa*, *C. glauca*, *C. Grevilleana* (*Lepraria aeruginosa* Schr?), *C. Hakodateana*, *C. humicola*, *C. indica*, *C. libricola* (*Lepraria lategricola* Brin.), *C. libricola silvicola* n. var., *C. lapidicola*, *C. lignicola* (*Lepraria chlorina*), *C. languinosa dolosa* n. var., (*Amphiloma languinosum* Gasil), *C. languinosa granulata* n. var., *C. languinosa inactiva* n. var., *C. albescens* n. var., *C. muscicola*, *C. minuta*, *C. marcia*, *C. mollissima*, *C. nagaskiana*, *C. nipponica*, *C. rigidula*, *C. simplex*, *C. souliei*, *C. salicicola*, *C. spongiosa*, *C. saricola*, *Lecidea neglecta* Lamy), *C. saricola languinosa* n. var., *C. saricola inactiva* n. var., *C. silvicola*, *C. singularis*, *C. scotica*, *C. terricola*, *C. Tongletii*, and *C. Yesonensis*.—The following old species have been transferred to *Crocynia*: *C. aeruginosa* Hue (*Lepra aeruginosa* Schoer.), *C. chlorina* Hue (*Lepra chlorina* Schoer.), *C. cretacea* Hue (*Lepraria cretacea* Thiull.), *C. flava* Hue (*Lepra flava* Ach. and *L. flava* Oliver), *C. lactea* Duf. (*Lepraria lactea* Duf. and *Byssus lactea* L.), *C. languinosa* (Ach.) Hue (*Parmelia languinosa* Ach.), *C. latibrum* (*Lepra* sp.), *C. neglecta* Hue (*Lecidea neglecta* Nyl.), and *C. squalens* Hue (*Lepraria squalens* Thiull.).—*P. A. Young*.

1626. KNIGHT, H. H. Lichens of the Windsor foray. Trans. British Mycol. Soc. 10: 9. 1924.—A list of 53 lichens is given.—*W. B. McDougall*.

1627. MOTYKA, JÓZEF. Studja nad flora porostów tatrzańskich. Część I. Porosty zebrane w dolinie Kościeliskiej. [Studies on the lichen flora of the Tatra. Part I. Lichens collected in the Koscieliska valley.] Acta Soc. Bot. Poloniae 2: 44-59. 1923.—This list gives some information on the distribution and ecology of the lichen flora of the western part of the Tatra.—*C. W. Dodge*.

1628. WAINIO, EDV. A. Lichenes ab A. Yasuda in Japonia collecti. Continuatio I. [Lichens collected by A. Yasuda in Japan.] Bot. Mag. Tokyo 30: 45-79. 1921.—There are described here a total of 182 species of Japanese lichens based on the collections of Yasuda. Almost all of these are new. They belong to the following genera:—*Usnea*, *Oropogon*, *Alectoria*, *Ramalina*, *Thamnia*, *Siphula*, *Cetraria*, *Parmelia*, *Anzia*, *Lecanora*, *Placopsis*, *Ochrolechia*, *Pertusaria*, *Perforaria*, *Pilophorus*, *Pilacodium*, *Anaptychia*, *Physcia*, *Melanospicilia*, *Rinodina*, *Buellia*, *Peltigera*, *Pseudocypbellaria*, *Sticta*, *Lobaria*, *Parmeliella*, *Coccocarpia*, *Leptogium*, *Collema*, *Cladonia*, *Lecidea*, *Acarospora*, *Sarcogyne*, *Lecanactis*, *Diploschites*, *Thelotrema*, *Graphis*, *Chiodecton*, *Arthonia*, *Sphaerophorus*, *Pyrenastrum*, *Thelenella*, *Mycoglossa*, *Polyblastia*, *Pseudopyrenula*, *Pornia*, *Anthracotheicum*, *Pyrenula*, *Leptosphæria*, *Stereocaulon*.—*S. Ikeno*. (Courtesy Japanese Jour. Bot.)

1629. YASUDA, ATSUSHI. Three new species of lichens. (Japanese.) Bot. Mag. Tôkyô 35: 84-87. 3 fig. 1921.—The following are described as new: *Ochrolechia akagienlusis* Yasuda, *Lecanactis Nakajii* Wain. & Yasuda, *Polyblastia japonica* Wain. & Yasuda.—*Author*. (Courtesy Japanese Jour. Bot.)

## BACTERIA

1630. FISHER, R. A., H. G. THORNTON, AND W. A. MACKENZIE. The accuracy of the plating method of estimating the density of bacterial populations with particular reference to the use of Thornton's agar medium with soil samples. Ann. Appl. Biol. 9: 325-359. 1 fig. 1922.—The question of accuracy of the plating method of estimating the density of bacterial populations, unlike the other elements in the interpretation of bacterial count data, is primarily a statistical question. Under ideal conditions the counts on parallel plates varied in the same manner as samples from a Poisson Series. From an examination of several large bodies of data the authors concluded that accurate conformity with the theoretical distribution, although rare, was not unattainable. Out of 362 sets of plates examined the majority represented true samples from the Poisson Series, such as would be the case if the biological and technical difficulties of the bacterial count method as applied to soil had been entirely overcome. When excessive variation occurred it was evidently due to the presence of certain soil organisms which exerted a toxic effect on the other forms and in 1 case disturbed the counts by multiple colony formation. Subnormal variation is indicative of some defect in the composition of the medium. Any significant departure from the theoretical distribution is a sign that the mean may be wholly unreliable.—*M. N. Levine*.

1631. GAUB, WILLIAM H., JR. **A bacteriological study of a sewage disposal plant.** New Jersey Agric. Exp. Sta. Bull. 394. 1-24. 1924.—In 1921 and 1922, tests were made on the sewage and sludge of the Riensch-Wurl screen, Imhoff tank and sprinkling filter beds of the plant at Lincoln, New Jersey, to determine the nature and work of the bacteria and their relative numbers. The results are as follows: (1) "There is a continual decrease in number of bacteria in each unit of the plant. The average final percentage of reduction throughout the four seasons of the year was 95 per cent at 37.5°C. and 94.3 per cent at 20°C. (2) The effluent from the plant causes an increase in the number of bacteria in the brook into which it is emptied, but this increase is eliminated in a distance of 450 feet. (3) The intestinal bacteria predominate throughout the plant. There is a gradual increase in the percentage of intestinal bacteria in all units preceding the sprinkling filter beds. A decrease in the percentage of these bacteria is found in the sprinkling filter beds and in the remainder of the units of the plant. (4) Sulfur-oxidizing bacteria were found in greatest numbers in the effluents of the sprinkling filter beds and final settling tank. Sulfate-reducing bacteria were found in the raw sewage and in the effluents of all units, with the greatest number in the raw sewage. Proteolytic bacteria (both gelatin-liquefying and casein-digesting) were found in the effluents of all units. In the final settling tank only the gelatin-liquefying type of proteolytic bacteria were found. The effluent from the Imhoff tanks showed the greatest number of these proteolytic bacteria. Cellulose-decomposing bacteria are found only in the concentrated sewage effluent of the Imhoff tanks and sprinkling filter beds. Ammonifying bacteria were found in the effluent of all units, while nitrifying bacteria were found only in great numbers in the effluent of the sprinkling filter beds. The Imhoff tanks showed the presence of them after a long incubation period and to a very much slighter degree. (5) Intestinal aerobic and anaerobic bacteria were the predominating types of bacteria found in the sludge. (6) The nitrifying type of bacteria were found in the sprinkling filter beds. None were found in the raw sewage and in the effluent from the Riensch-Wurl screen. The effluent from the Imhoff tanks showed relatively only a few nitrifying bacteria; that from the sprinkling filter beds and final settling tank showed these bacteria in greatest numbers. (7) The relative stability of the effluents of the various units increases with the successive units in the process of treatment."—Isador W. Mendelsohn. [*Public Health Eng. Absts.*]

1632. KOSER, STEWART A. **Is ability to utilize citrate readily acquired or lost by the colon-aerogenes group?** Jour. Infect. Diseases 35: 315-322. 1924.—Earlier reports by the author indicate that citrate utilization is a better index for differentiating organisms of the colon-aerogenes group than are other known methods. To determine whether the ability to attack citrate becomes changed under different conditions of growth, the organisms were cultivated in mineral waters, soils and stool suspensions. Growth was also studied in continuous transfer in citrate media. It is concluded that the ability to utilize citrate is very constant and is neither acquired nor lost. The citrate test is recommended as a reliable means of differentiating intestinal colon bacilli from the other members of the group.—R. L. Starkey.

1633. MORRISON, LETHE E., AND FRED W. TANNER. **Studies on thermophilic bacteria.** Bot. Gaz. 77: 171-185. 1924.—Eighty-nine strains of thermophilic bacteria were isolated from water, soils, hog and cow feces, and a commercial bottled milk. These strains were grown at 55°C. and determinations of their various morphological, cultural, biochemical and physiological characters made. According to the index number of the descriptive chart, the 89 strains fell into 12 classes, 9 of which contained only a single strain. However, the thermophilic bacteria seem to constitute a homogenous group having the more important characters in common. The function of ability to grow only at high temperatures is to some extent a relative one, depending upon the culture media and the time of incubation; however, the so-called strict thermophilic bacteria showed a much more rapid growth at 55°C. than at lower temperatures. The thermal resistance of 18 of the above strains was studied. At the higher temperatures 115 and 120°C., the thermal death points fell within narrower time limits than those at the lower temperatures 100-110°. A tentative separation of bacteria into 7 groups on the basis of their reaction to temperature is presented in the paper.—I. V. Shunk.

1634. SOPPELAND, LULU. **Flavobacterium suaveolens, a new species of aromatic bacillus isolated from dairy wastes.** Jour. Agric. Res. 28: 275-276. 1924.—A description of a new



species of aromatic bacillus isolated from dairy wastes is given. Morphological, cultural and physiological reactions are reported. This species produces a sweet-scented odor in all media containing protein. During the 3 years this organism has been under observation, it has manifested its aroma-producing properties in subcultures, apparently undiminished. According to Bergey's classification, it belongs in the genus *Flavobacterium*.—*Author*.

1635. WHEELER, MARY W., AND ELEANOR M. HUMPHREYS. Isolation of *B. botulinus*, type *B.* from feces by use of blood agar plates in an anaerobic jar. *Jour. Infect. Diseases* 35: 305-310. 1924.—The presence of *B. botulinus* in a specimen of feces from a typical case of botulinus poisoning was demonstrated and the organism was isolated on horse-blood extract agar in a H anaerobic jar. Development of several anaerobic organisms was studied on different media.—*R. I. Starkey*.

### MYXOMYCETES

1636. HENRY, M. RENÉ. Sur la présence dans les Vosges de quelques Myxomycetes. [The presence of some Myxomycetes in the Vosges.] *Bull. Soc. Bot. France* 71: 256-257. 1924.—The author discusses 3 old species.—*P. A. Young*.

1637. LISTER, G. Mycetoza of the Windsor foray. *Trans. British Mycol. Soc.* 10: 8-9. 1924.—A list of 37 species of myxomycetes is given.—*W. B. McDougall*.

## PALEOBOTANY AND EVOLUTIONARY HISTORY

EDWARD W. BERRY, *Editor*

(See also in this issue Entries 1205, 1221, 1276, 1368, 1376, 1472, 1492, 1534, 1576)

1638. BERRY, EDWARD W. Fossil plants and Unios in the Red beds of Wyoming. *Jour. Geol.* 12: 488-497. *Fig. 1-7*. 1924.—The author calls attention to the shells of *Unio*, and describes the following plant forms from the upper Triassic (Papo Agie) Red beds near Lander, Wyoming: *Podozamites* (?) sp., *Zamites* sp., *Zamites* (?) sp., *Pterophyllum browni* n. sp., *Pterophyllum* (?) sp., and *Equisetum* sp.—*Author*.

1639. BERRY, EDWARD W. New Tertiary species of *Anacardium* and *Vantanea* from Colombia. *Pan Amer. Geol.* 42: 259-262. *Fig. 1-4*. 1924.—This describes the fruit of *Anacardium eocenicum* n. sp. from the middle Eocene of the Dept. of Bolivar, and the stones of *Vantanea colombiana* n. sp. from the Oligocene of Cundinamarca, in Colombia.—*Author*.

1640. BERRY, EDWARD W. The food value of an *Equisetum* from the Lance formation of Saskatchewan. *Canadian Field Nat.* 38: 131-132. *Fig. 1*. 1924.—The author figures and describes the large tubers borne at the nodes of the underground stems of *Equisetum arcticum* Heer. This species is common in the Lance formation of Saskatchewan where it bears unusually large tubers and is associated with the bones of dinosaurs. It is suggested that these tubers, high in starch, may have been a considerable item in the diet of the herbivorous dinosaurs.—*Author*.

1641. BOWER, F. O. Remarks on the present outlook on descent. *Proc. Roy. Soc. Edinburgh* 44: 1-7. 1924.—This paper points out the interrelationship of formal and causal morphology and their bearing upon phylogeny. Comparative study of form is the strongest argument in favor of evolution because form is the visible result of physiology. An interpretation of formal morphology in the light of function and conditions, both external and internal, leads to the conclusion that certain vascular structures depend upon size rather than upon affinity and, thereby, lose value for phyletic analysis. (See *Bot. Absts.* 12, Entry 6454; 14, Entry 1534.) Phyletic drifts depend upon a detailed knowledge of form for their recognition. These are material for causal inquiry and have an important bearing upon evolutionary problems. Such a study may fail to reveal the imaginary evolutionary tree with a single trunk, but even though many separate lines of origin may be shown the evolutionary theory remains as sound as ever.—*Ray C. Friesner*.

1642. BRAUCH, W. Verbreitung und bau der deutschen Zechstein-Riffbildungen. [Distribution and structure of the German Zechstein reef formation.] *Geol. Arch.* 2: 100-187.

1923.—In this mainly geological paper the author lists the foliage or cone scales of the following Permian conifers contained in the sandy marls associated with the reef limestones: *Voltzia liebeana*, *V. hexagona*, *V. brongniarti*, *Ullmania frumentaria*, *U. selaginoides*, *U. bronni*.—*E. W. Berry*.

1643. CARPENTIER, A. Sur les végétaux à structure conservée d'un silex Permien. [Concerning silicified plants with structure preserved in the Permian.] *Rev. Gén. Bot.* 36: 241-251. 1924.—Foliar organs were found which resemble the bracts of *Calamostachys Grand'Euryi* Renault. The melasmatic tissue was well developed about the vascular bundles as in the leaves of *Asterophyllites* of Thomas. Under the epidermis a thick couch recalled a palisade tissue or, according to its method of preservation, a fibrillar tissue. It appeared that the small leaves with recurved edges and palisade tissue very closely resembled those of an *Annullaria* in the neighborhood of *A. stellata*. Some good sections of *Anachoropteris Decaisnei* were observed. Sporangia with very plain rings and cellular thickenings in a horse-shoe form, recalled those that Renault and Zeiller found in the siliceous pebbles of Autun; they recalled also the sporangia attributed to *Botryopteris* of the Culm, both suggesting the Osmundaceae. Some young roots with woody stele, often thick and only seen in some rays, were found here and there in the sections. Their cortical tissue was not differentiated, save in 1 case where a thin zone of fibrous elements at the periphery of the core was observed. Some leaves of Cordaitales with pronounced xerophilic characters were also noted, but especially some roots of the genus *Amyelon* which were apparently identical with rootlets that Lignier described from Grand' Croix, in 1906, under the name *Radiculites reticulatus*. Although in the absence of resin canals and in the presence of secretory cells they approached the roots of *Taxus*, their wood was of the type of *Araucarioxylon* or *Dadoxylon*.—*J. C. Gilman*.

1644. CLARK, F. L. Coal balls—the "finger prints" that identify coal. *Coal Age* 26: 656-657. *Fig. 5*. 1924.—This is a popular, illustrated account of the search for fossil-bearing concretions in the coal measures of this country.—*E. W. Berry*.

1645. COULTER, JOHN M. The present status of evolution. *Illinois Acad. Sci. Trans.* 16: 29-36. 1923.—This is presented from the viewpoint of a botanist. Bateson's Toronto address is quoted to show that he believed thoroughly in evolution. The popular confusion between Darwinism and evolution is mentioned. The problem facing scientists is not the fact of evolution but the explanation of evolution. Evolution is a complex of problems. No single explanation can be adequate. Lamarckism or the inheritance of acquired characters is again receiving attention due to the fact that recent research tends to prove this to be possible. Attention is called to deVries' mutation theory as contributing to an explanation of evolution but not a complete explanation. Great strides have recently been made in actually demonstrating by carefully controlled experiments the facts which were inferred by Darwin and earlier students. Geneticists have played an important part in clearing up many disputed points. The problem of progressive evolution commonly called "orthogenesis" is the one facing modern scientists. "Progressive evolution may be likened to a deep-seated oceanic current which moves steadily in one direction without any reference to the choppy surface." The author illustrates this by his own observations on the evolution of the gymnosperms.—*H. W. Anderson*.

1646. EDQUIST, A. G. Petrified remains of trees. *South Australian Nat.* 1: 24-25. *1 fig.* 1920.—A general discussion of tree remains in red sands from Plympton to the Grange Pinery, is given.—*Wm. Randolph Taylor*.

1647. FOERSTE, AUG. F. Notes on Medinan, Niagran, and Chester fossils. *Denison Univ. Bull.* 23: 37-120. *Pl. 4-15a*. 1923.—In the main the paper has to do with fossil fauna but discusses "A Stigmarian root from the Chester Formation of Illinois," including *Dictyophlois reticulata illinoisensis* n. var.—Descriptions of *Leveilleites* n. gen., *L. hartnageli* n. sp., *Buthotrephis creditensis* n. sp., and *Dictyonema scalariforme creditensis* n. var. are also given; *Leveilleites* has algal resemblances but is thought more probably to be of animal origin.—*Frederick V. Rand*.

1648. GARDNER, N. L. Two new fossil algae from the Miocene. *Proc. Acad. Nat. Sci. Philadelphia* 75: 361-363. *Pl. 25*. 1924.—This paper describes *Palaeohalidrys californica* n. gen. and sp. and *Cystoseira occidentalis* n. sp. from Miocene diatomaceous beds of California.



The former is from Los Angeles and the exact locality where the latter was collected is unknown.—*E. W. Berry.*

1649. KLÄHN, HANS. Die Petrogenese der Kalktuffe nebst einigen sich darausergebenden geologischen Problemen. [The petrogenesis of calcareous tufa together with its bearing on geological problems.] Geol. Arch. 2: 298–316. 1923.—This is an account of the origin of the calcareous tufa which is common in the Pleistocene and recent deposits of Europe. The author records *Cratoneuron commutatum* and *Marchantia polymorpha* in German specimens.—*E. W. Berry.*

1650. ЛЮБИМЕНКО, В. [LUBIMENKO, W.] О хлорофилле в отложениях озерного ила. [Chlorophyll in slime precipitations of lakes.] Дневник первого русского ботанического конгресса [Jour. Russian Bot. Congr.] 1: 50. 1921.—The author calls attention to the fact that the question of fossil chlorophyll has not yet been treated in botanical literature. Investigations have shown that chlorophyll is constantly present in typical sapropel, while it is not habitually found in the humus or peat soils.—*V. Malčevsky.*

1651. NOË, A. C. The present status of paleobotany in Illinois. Trans. Illinois State Acad. Sci. 15: 119–120. 1922.—Lesquereux gave numerous descriptions of fossil plants in Illinois in 1866 and 1870. These are in need of revision. White in 1906, 1907, and 1908 made extensive contributions to the paleobotany of Illinois. The author has made extensive collections upon which he plans to report at a later date.—*H. W. Anderson.*

1652. ROUND, EDA M. Correlation of fossil floras of Rhode Island and New Brunswick. Bot. Gaz. 78: 116–118. Fig. 1–4. 1924.—Ten species are reported from the Rhode Island coal which have been previously reported by Stopes from St. John, New Brunswick. A table showing the location of the 10 species in the Narragansett basin is presented.—*B. W. Wells.*

1653. ROVERETO, G. Sui ramponi di laminarie fossili detti fucoidi, e sull'origine dei colloid minerali di cui sono costituiti. [On the "hold-fasts" of the fossil laminarians called fucoids and on the origin of the colloidal minerals of which they are constituted.] Atti. Accad. d. Lincei Rome sér. 5, 29 (Semestre 1): 155–159. 1920.—This is a somewhat cursory discussion of the mineralogical composition of the radices or hold fasts of recent fucoids and of selected examples of fossil species from the Lias, Eocene, Oligocene and Pliocene of Europe.—*E. W. Berry.*

1654. VRIES, HUGO DE. Über Stammbäume von Pflanzenfamilien. [Ancestral trees of plant families.] Naturwissenschaften 11: 437–441. 1923.—Using the Willis Age and Area theory as a basis, de Vries discusses the problems of phylogeny, taking the evolution of the Compositae as worked out by Small as a type to work out the sequence of families from the Tertiary period onward.—*Orton L. Clark.*

1655. YULE, G. UDNY. A mathematical theory of evolution, based on the conclusions of Dr. J. C. Willis, F. R. S. Phil. Trans. Roy. Soc. London B. 213: 21–87. 14 fig. 1924.—The discussion and mathematical treatment does not lend itself to abstraction. In conclusion it is stated that "If the age of the flowering plants is a 100 million years, or thereabouts, the doubling-period for species is probably of the order of some 2 or 3 million years: it is, say, almost certainly over 1 million and less than 6 millions. The present rate of production of viable specific mutations, amongst all flowering plants on the whole surface of the globe, is almost certainly less than 1 in 10 years and more than 1 in 60 years; it probably lies between 1 in 15 and 1 in 30 years. The assumption of a polyphyletic origin for the flowering plants would not very greatly affect these figures. Specific mutations must, therefore, be such exceedingly rare events that no valid argument, as it seems to me, can be based on the fact that we have no experience of such occurrences. My calculations fully confirm Dr. Willis's conclusion in this respect."—*W. R. G. Atkins.*

## PATHOLOGY

FREDERICK V. RAND, *Editor*LILLIAN C. CASH AND HARRY BRAUN, *Associate Editors*

(See also in this issue Entries 1033, 1034, 1039, 1052, 1067, 1073, 1103, 1122, 1166, 1171, 1186, 1187, 1189, 1191, 1203, 1211, 1225, 1226, 1238, 1239, 1244, 1294, 1301, 1303, 1317, 1319, 1325, 1338, 1340, 1344, 1355, 1465, 1468, 1470, 1473, 1476, 1521, 1522, 1590, 1592, 1602, 1609, 1610, 1612, 1616, 1630, 1792, 1822, 1842, 1912, 1931, 1932, 1933, 1937, 1967, 1980, 1987, 2104)

## DISEASES CAUSED BY FUNGI

1656. ANONYMOUS. **Banana diseases.** Jour. Jamaica Agric. Soc. 28: 247-248. 1924.—This is primarily a report on the prevalence of the Panama disease of bananas due to *Fusarium cubense* in Jamaica. There was an increase in the number of cases reported and in addition new localities were invaded. Large irrigated districts remain free of disease.—*John A. Stevenson.*

1657. ANONYMOUS. **Desarrollo de las enfermedades de origen criptogamica en la viña, durante la presente estacion.** [Development of cryptogamic vine diseases during the present season.] Defensa Agricola [Uruguay] 5: 1-3. 2 fig. 1924.—Where proper spraying operations were not carried out, vine diseases, including anthracnose (*Gloeosporium*), mildew (*Uncinula*) and downy mildew (*Plasmopara*) were prevalent in Uruguay during 1923 with resulting losses.—*John A. Stevenson.*

1658. ANONYMOUS. **El cancer del peral.** [Pear canker.] Defensa Agricola [Uruguay] 5: 25-26. 2 fig. 1924.—Small cankers developed at the base of fruit spurs of several varieties of pears under trial, and were apparently due to *Monilia* sp. This fungus is said to be distinct from *Sclerotinia* (*Monilia*) *fructigena*.—*John A. Stevenson.*

1659. ANONYMOUS. **Encrespadura del duraznero.** [Peach leaf curl.] Defensa Agricola [Uruguay] 4: 91-93. 2 fig. 1923.—The symptoms and control measures of the peach disease due to *Eoascus deformans* are discussed.—*John A. Stevenson.*

1660. ANONYMOUS. **La enfermedad de la hoja de tomate.** [Tomato leaf disease.] Defensa Agricola [Uruguay] 5: 17-23. 5 fig. 1924.—This article discusses the symptoms of the tomato disease caused by *Septoria Lycopersici* Speg., gives the life history of the causal organism and outlines control measures.—*John A. Stevenson.*

1661. ANONYMOUS. **La sarna de la papa y manera de combatirla.** [Potato scab and its control.] Defensa Agricola [Uruguay] 4: 106-108. 3 fig. 1923.—The symptoms and control measures of the potato disease due to *Actinomyces scabiei* are given.—*John A. Stevenson.*

1662. AKERMAN, A. **Sommarens gulrostangrepp på vetet.** [Attacks of yellow rust upon wheat during summer.] Sver. Utsädesf. Tidskr. 33: 262-267. 1923.—Yellow rust was very common during the summer of 1923 in the province of Skaane, Sweden. Among the wheat varieties more generally cultivated, Pansar II was most severely infected, while in former years, for instance in 1910, 1911 and 1916, this wheat was almost immune from rust. A table showing the classification of different varieties commonly grown in Sweden, according to the degree of rust-resistance is given. It has usually, though not always, proved true that the severe yellow-rust years were preceded by winters so mild that the wheats most susceptible to cold hibernated without suffering appreciable injury. The climate during winter does not represent the sole cause of the amount of disease, however, for after the mild winters of 1902 and 1922, the disease was almost entirely absent. There seems no doubt that hibernating mycelia or uredospores have played a role of some importance. Other problems such as the irregular occurrence in spots in certain fields and the possibility of there being biologic forms of yellow rust are discussed. The disease may be prevented, at least to some extent, by sowing early, selecting good seed, and applying fertilizers containing a large percentage of potassium and phosphoric acid. The best precaution, however, is to use rust-resistant varieties.—*Lillian C. Cash.*

1663. ALCOCK, N. L. **A disease of Narcissus bulbs caused by a sclerotium-producing fungus.** Trans. British Mycol. Soc. 10: 127-128. 1924.—A fungus with white mycelium and minute black sclerotia is reported as producing a disease of *Narcissus*.—*W. B. McDougall.*



1664. ATANASOFF, D. *Dilophospora-ziekte van granen*. [Dilophospora disease of cereals.] Tijdschr. Plantenz. 30: 145-159. Pl. 2-5. 1924.—The disease has been seen on wheat, rye, and spelt and is known to occur on numerous grasses in Europe and America. The causal organism glues together and destroys the central or upper portions of immature plants, causing very pronounced malformation, and preventing heading out. On the leaves it produces numerous small black blotches or stripes consisting of pycnidia. This disease occurs only on plants already infested by the larvae of *Tylenchus tritici* (Stein) Bast. There exists a very unique and most intimate relation between these 2 parasites, without which the parasitism of *Dilophospora* is absolutely impossible. The fungous spores have on both ends a number of fine appendages by means of which they attach themselves firmly to the nematodes. The latter, bearing the spores of the fungus, deposit them on the growing points of the plants. Here the spores germinate, forming numerous "secondary" spores which also have appendages and are spread further in the plant by the constantly moving nematodes. The secondary spores also germinate, giving rise to mycelia, which grow in the cavities around the vegetative point, penetrating eventually into the young leaflets. Infected leaflets, when rapidly developing, succeed in coming out of the leaf sheaths of the preceding leaf, but show marked symptoms of infection. Infected leaflets of slowly growing plants are overgrown and glued together by the fungus before they succeed in leaving the sheaths, which usually leads to the destruction of the growing point and death of the plant. Numerous artificial inoculations with *Dilophospora* used alone, made in various ways and with plants of different ages gave in all cases negative results. Successful infections were obtained only when both nematode and fungus were applied simultaneously in water suspension poured over the plants. When the nematodes are too heavily loaded with spores of *Dilophospora*, both diseases fail to develop. Elimination of the nematode galls from the seed controlled both diseases.—*Author*.

1665. BARKER, H. D., AND H. K. HAYES. *Rust resistance in timothy*. Phytopathology 14: 363-371. 1 fig. 1924. [For abstract see this issue, Entry 1355.]

1666. BEAUVERIE, J. *Échelle de sensibilité des blés à la rouille jaune Puccinia glumarum en 1923*.—Station de Sélection de la 7e région, à Lafont, près de Riom (Puy-de-Dôme). [Variation in susceptibility of wheat varieties to *Puccinia glumarum* in 1923.] Rev. Path. Vég. et Entomol. Agric. 11: 26-28. 1924.—As a result of tests under the climatic conditions of 1923, which were exceptionally favorable to invasion by yellow rust, wheat varieties are listed in the following groups: (1) Immune or very resistant, (2) fairly resistant, (3) medium resistant, (4) susceptible, and (5) very susceptible.—*Frederick V. Rand*.

1667. BEAUVERIE, J. *Notes pour l'étude internationale des rouilles du blé*. [Notes on the international study of wheat rusts.] Rev. Path. Vég. et Entomol. Agric. 11: 29-31. 1924.—At the International Congress of Phytopathology held at Wageningen, Holland, June 1923, a coordinated, international study of wheat rusts was solicited. Among the author's suggestions toward this end are the following: The investigator must distinguish definitely the 3 major rusts, *Puccinia glumarum*, *P. triticea*, and *P. graminis*, under varying conditions of climate and varieties. Simultaneously in various localities graphs should be made showing meteorological conditions and intensity of development of the 3 rusts. A study should be made of the relations between meteorological conditions and the "critical period of wheat," and the reaction of each wheat variety to the 3 rusts. The relations between precocity or tardiness of varieties and their susceptibility to each of the rusts must be noted, as also the relative susceptibility of different varieties at different stages of their development.—The establishment of regional selection stations is desirable. These would permit a precise study of the relations of climate to the rusts, a selection of locally resistant strains or hybrids of wheat, the determination of the races of rusts for different regions, and the application of breeding methods to the development of resistant varieties. The results obtained each year should then be collated and analysed at a central office, and conclusions drawn for the orientation of new researches.—*Frederick V. Rand*.

1668. BERNÈS, J. *Dépérissement et mortalité des arbres fruitiers dans le Var*. [Dying-off of fruit trees in the Var.] 14 p. Oliver-Joulian, Draguignan, 1922.—This contains brief popular descriptions and methods of controlling diseases caused by species of *Eroascus*, *Fusicladium*, *Stromatinia*, *Coryneum*, *Armillaria*, *Roesleria* and *Dematophora*.—*Harry Braun*.

1669. BRUYN, HELENA L. G. DE. De oorzaak van het epidemisch optreden van de phyto-phthoraziekte van de seringén. [The cause of the epidemic appearance of Phytophthora disease of lilacs.] Tijdschr. Plantenz. 30: 113-122. Pl. 1. 1924.—*Phytophthora Syringae* lives usually as a saprophyte in the soil, but under moist conditions it attacks the leaves of lilacs, causing partial or complete death and premature abscission. Only with extremely moist weather in August and September do the leaf infections spread over the bark, of the branches, leading to infection and death of the buds. The fungus can parasitize the bark only during the dormant period, so that the pathologic changes on the branches become apparent first during winter. Collecting infected leaves in years during which August and September are abnormally rainy may prevent a heavy infection of the branches.—*D. Atanasoff*.

1670. CRISANTO, JOSÉ. *Rhizopus artocarpí*: its cultural characters and its relation to *Rhizopus nigricans*. Philippine Agric. 12: 465-468. 1924.—A description is given of the rot of jak-fruit, *Artocarpus integra* (Thunb.) Merr., caused by *Rhizopus Artocarpí* Rac. *Rhizopus nigricans* Ehr. may attack jak-fruit, producing a similar disease.—*Sam F. Trelease*.

1671. DEMAREE, J. B. Pecan scab with special reference to sources of the early spring infections. Jour. Agric. Res. 28: 321-330. Pl. 1-2. 1924.—Late summer and early fall infections of pecan scab, *Fusicladium effusum* Wint., develop, as a rule, more or less hemispherically shaped, black sporulating stromata on the infected twigs, nuts and petioles. The hyphae composing the stromata remain alive during the mild winters of the Southern U. S. A. and produce conidia copiously during April and May at the time the new leaves are unfolding. Any meristematic tissue of leaves, twigs and nuts seems to be subject to infection. The leaves become immune when they are fully grown and have taken on the dark green color. The nuts and the tips of growing twigs are susceptible to infection throughout the growing season. The unfolding leaves are very susceptible to infection and also to serious spray injury, necessitating several days delay of the spray schedule until the leaves have grown out of the stage when they are likely to be injured. The sources of early spring infections should be reduced to a minimum by practicing sanitary measures so that the leaf infections will be retarded until it is safe to apply a protective spray. Under certain weather conditions, summer applications of Bordeaux mixture cause complete defoliation of pecan trees. Bordeaux mixture has proved to be the most effective of the various spray materials tested.—The great size of mature pecan trees, the frequency of summer rains normally occurring in the Southern pecan belt, the long period of susceptibility of the nuts to infection, the production of large numbers of spores from the twig-stromata situated in close proximity to the young susceptible leaves, and the habit of the pecan of putting on a new growth of leaves and twigs subject to infection during the rainy period of June and July are factors which increase the difficulty of controlling this disease by spraying.—*Author*.

1672. DODDS, H. H. Menace of streak disease. South African Sugar Jour. 8: 549. 1924.—The author believes that only by systematically selecting cane free from the fungous streak disease can serious danger from this source be avoided.—*Nellie E. Fealy*.

1673. DRĂGAN, I. C. Combaterea mǎlurei. [Control of stinking smut.] Viața Agric. [București] 13: 559-560. 1922.—To destroy the spores of stinking smut (*Tilletia Tritici*) a solution of 1% formaldehyde was used and tested out in the experimental field of the agricultural school at Cluj, Roumania.—*Al. Borza*.

1674. DRĂGAN, I. C. Germinația cerealelor infectate de ciuperci. [Germination of cereal seed attacked by fungi.] Viața Agric. [București] 13: 259-266. 1922.—Experiments with grain seed attacked by fungi show the conditions under which the fungi can hinder germination.—*Al. Borza*.

1675. DURRELL, L. W. The nodal infection of corn by *Diplodia zeae*. (Abstract.) Proc. Iowa Acad. Sci. 29: 346-347. 1922 [1924].

1676. FAWCETT, GEO. L. Una enfermedad del Tomate en Lules. [A tomato disease in Lules.] Rev. Indust. y Agric. Tucuman 13: 142-144. 1923.—Tomato plantings in parts of the Province of Tucuman have been seriously attacked by leaf spot (*Septoria Lycopersici* Speg.). Control measures are outlined.—*John A. Stevenson*.

1677. FRITZ, CLARA W. Cultural criteria for the distinction of wood-destroying fungi. Honorary Advisory Council Sci. and Indust. Res. Canada Rept. 13. P. 191-238. Pl. 1-12



(4 col.). Ottawa, 1924. (Reprint. Trans. Roy. Soc. Canada Sect. 5, 17: 191-288. Pl. 1-12. 1923.)—Cultural characters of diagnostic value are given for the following wood-destroying fungi: *Fomes applanatus*, *F. fomentarius*, *F. igniarius*, *F. pinicola*, *F. roseus*, *Polyporus borealis*, *P. balsameus*, *P. Schweinitzii*, *P. sulphureus*, *Polystictus abietinus*, *P. versicolor*, *Trametes Pini*, *Poria subacida*, and 4 undetermined fungi.—*Harry Braun*.

1678. GHITESCU, V. *Mălura graului*. (*Tilletia caries*). [Stinking smut.] *Viața Agric.* [București] 13: 459-461. 1922.—The commonest methods for combating *Tilletia* are given.—*Al. Borza*.

1679. GIACCONE, VICENTE. *Tratamiento en primavera y verano contra varios enemigos del viñedo*. [Spring and summer treatments for vine enemies.] *Defensa Agrícola* [Uruguay] 4: 89-90. 1923.—Recommended treatments for vine diseases due to *Plasmopara viticola*, *uncinula necator*, *Gloeosporium ampelophagum* (*Sphaceloma*) and *Guignardia bidwelli* are given.—*John A. Stevenson*.

1680. GIDDINGS, N. J., AND ANTHONY BERG. *Report on disease control in West Virginia*. *Crop Protection Digest Bull.* 14: 28-29. 1924.—Tabular data are given showing control of black rot and scab on apple leaves, by various mixtures of dusts and sprays.—*F. D. Fromme*.

1681. HEALD, F. D., AND B. F. DANA. *Notes on plant diseases in Washington*. 1. *Botrytis* diseases. *Trans. Amer. Microsc. Soc.* 43: 136-144. 1924.—*Botrytis* diseases are presented alphabetically for 20 hosts as to symptoms, effects and occurrence in the state of Washington, U. S. A.—Cranberry; jonquil, lilac, periwinkle, snowball, rose and squash appear to be new hosts.—*Botrytis cinerea* Pers. is evidently the common species in the state, *B. Allii* Munn, *B. Paeoniae* Oud., and *B. Tulipae* (lib.) Hopkins being the only other species definitely determined.—*Frederick V. Rand*.

1682. KNECHTEL, W. R. *Boalele care cauzează putrezirea fructelor*. [Fruit-rots.] *Viața Agric.* [București] 13: 178-181. 1922.—In Roumania, apple and pear are attacked by *Sclerotinia* (*Monilia*) *fructigena*; cherry, plum and apricot, by *S. cinerea*; and fall apricots, by *S. lara*.—*Al. Borza*.

1683. KOEHLER, BENJAMIN, JAMES G. DICKSON, AND JAMES R. HOLBERT. *Wheat scab and corn rootrot caused by Gibberella saubinetii in relation to crop successions*. *Jour. Agric. Res.* 27: 861-879. Pl. 1-2, fig. 1-3. 1924.—A careful survey was made of the importance of wheat scab in Illinois, Indiana, Iowa, Minnesota, Ohio, Tennessee, and Wisconsin in the summer of 1919. This was followed by more intensive work in Illinois during the 2 succeeding years. Losses due to scab were practically twice as severe when wheat followed a corn crop as when it followed one of the small grains; losses were still less when wheat succeeded a clover or timothy crop than when it followed the small grains. The scab in this area was found to be caused almost wholly by *Gibberella saubinetii* (Mont.) Sacc.; only 2 to 6% was caused by other *Fusarium* spp. Considerably more corn root rot occurred when corn was grown after a crop of scabby wheat than when it was grown after clover or bluegrass. When corn was grown on clean soil (after blue grass sod) considerable reductions in stand, vigor, and yield occurred when the seed was inoculated at planting time with a pure culture of *Gibberella saubinetii*. Wheat should never succeed a corn crop in the crop sequence, and corn should not succeed wheat when the latter has been appreciably affected by scab.—*B. Koehler*.

1684. KROUT, WEBSTER S. *Spraying and dusting for the control of apple scab in Massachusetts*. *Crop Protection Digest Bull.* 1. 30-36. 1924.—Successful control of apple scab was obtained by spraying either with lime sulphur or Bordeaux mixture, or by dusting with sulphur dust or copper-lime dust. Copper-lime dust gave better control of scab than sulphur dust but caused russetting of fruit and burning of leaves. The pre-pink and pink applications are most important for scab control.—*F. D. Fromme*.

1685. MAMMEN, VON. *Der Hexenbesen der Birke*. [Witches' broom of birch.] *Forstwiss. Centralbl.* 46: 402-403. 1924.—Of 98 specimens of *Betula alba* in a park, 4 had witches' brooms caused by *Taphrina* (*Exoascus*) *turgida* Sadel., while 19 of the 42 *B. pubescens* had witches' brooms caused by *Taphrina betulina* Rostr.—*W. N. Sparhawk*.

1686. MARQUEZ, SEVERO. *Leaf blight of corn*. *Philippine Agric.* 12: 453-458. 1924.—A description is given of a leaf blight of corn (*Zea Mays*) caused by a fungus that appears to be *Helminthosporium inconspicuum* Cke. and Ell.—*Sam F. Trelease*.

1687. NOBLE, R. J. *Rhizoctonia scab* in potatoes. Agric. Gaz. New South Wales 35: 631-632. 1 fig. 1924.—A popular description is given of the disease, with recommendations for control by the use of  $\text{HgCl}_2$  treatment.—*L. R. Waldron.*

1688. NORTON, J. B. S., W. N. EZEKIEL, AND R. A. JEHL. Fruit-rotting Sclerotinias. I. Apothecia of the brown rot fungus. Maryland Agric. Exp. Sta. Bull. 256. 1-32. Fig. 1-19. 1923.—Studies at the Maryland Station on the development of the apothecia of the Sclerotinia causing brown rot of stone fruits, are reported. Observations for several seasons show that the apothecia (as many as 25 on a single mummied fruit) develop slowly for over a month in early spring and reach maturity while the peaches are in bloom. This is true of early as well as of late blooming seasons. The time of apothecia production is also correlated with germination of the seed in mummied fruits. Rate of development of apothecia is favored by abundant moisture and high temperatures (up to  $30^\circ\text{C}.$ ). Sclerotia on buried mummies do not produce apothecia, but may do so even as much as 2 years later, when they are again brought to the surface.—Tests of fungicides showed that elemental S dusted over soil and sclerotia has at first only a slight inhibiting effect on apothecia development; this is followed by a distinct stimulating effect. Lime sulphur solution and  $\text{CuSO}_4$  were also ineffective, while  $\text{HgCl}_2$  in 1-5000 solution, killed the developing apothecia. The relation of H-ion concentration to growth of apothecia was studied by cultures of mummied fruit suspended in buffer solutions. The optimum for growth is near pH 2.5; the limits are near pH 1.4 and 7.0. Since most orchard soils would fall in the upper portion of this range, the application of lime to the soil surface in spring is suggested as a control measure. In pot experiments this proved successful. It is stated that control of apothecial development is of practical value in the prevention of the disease, the apothecia being considered as the chief source of infection in spring.—*J. T. Rosa.*

1689. PAMMEL, L. H. The species of *Rhamnus* in southwestern United States and the Pacific Coast and *Puccinia coronata*. Proc. Iowa Acad. Sci. 29: 267-270. 1922 [1924].—A list of species of *Rhamnus* represented in the herbarium of Iowa State College, with localities is given. The author's recent search in the field revealed *Puccinia coronata* only at Wawona, California, on *Holcus lanatus*.—*H. S. Conard.*

1690. PARROT, P. J. Experiments with dust and spray mixtures in New York apple orchards. Crop Protection Digest Bull. 1. 14-18. 1924.—Better control of apple scab was obtained with spray mixtures than with dust, except in 1 case where they were about equal in efficiency. Dusts were less effective than sprays in control of San Jose scale and rosy aphid. Red bug control was satisfactory with nicotine sulphate applied in both dust and liquid carriers.—*F. D. Fromme.*

1691. PELTIER, GEORGE L., AND WILLIAM J. FREDERICH. Relation of environmental factors to citrus scab caused by *Cladosporium citri* Massee. Jour. Agric. Res. 28: 241-254. 2 fig. 1924.—A brief history of the disease and its distribution are given. The fact that citrus scab has not been reported from the citrus-growing regions of the Mediterranean countries, California, U. S. A., and the Philippines is commented upon.—The cardinal points, for the growth of the organism in culture, for the host plants, and for infection and the subsequent development of the disease, were determined under controlled conditions. It was found that the 3 essentials for successful infection of citrus plants by *Cladosporium citri* under controlled conditions, were the presence of free moisture, young growth, and temperatures between 15 and  $23.5^\circ\text{C}.$  The optimum for the best development of scab appears to be about  $20-21^\circ\text{C}.$ —Under Alabama conditions, temperatures for optimum infection usually prevail during April and May. Sufficient moisture is generally at hand during this interval for successful infection to take place. The most important and variable factor is the development of the 1st spring growth.—It was found that any environmental factor or factors inducing a slow or slight spring growth and rapid maturation or late starting of susceptible varieties favor scab escape, while any environmental factor or factors which induce a large amount of spring growth and subsequently slower maturation, especially during the period of optimum infection, favor scab attacks. In this connection the internal factors influencing the development of spring growth of citrus trees must be considered as well as the external factors which may inhibit or stimulate these processes.—The conditions essential for an epiphytotic in Alabama,



are a late season, sufficient moisture, and the development of spring growth at the time optimum temperatures for infection prevail. An early season is favorable to scab escape, in that the 1st spring growth is about complete when optimum conditions for infection are at hand.—Under Alabama conditions a light or bad scab year can be predicted by the monthly mean temperature prevailing during March. A monthly mean temperature below normal is indicative of a bad scab year, while a temperature normal (15–16°C.) or above is an indication of a light infection.—The relation of weather and its effects on the distribution and prevalence of citrus scab is shown for several countries and the absence of scab in certain localities is correlated with either a mean temperature too high for infection or a deficiency in rainfall either during the growing season or throughout the year.—*G. L. Peltier*.

1692. POTATO SYNONYM COMMITTEE. Report of the potato synonym committee on the potatoes sent for immunity trials to the potato testing station, Ormskirk, Lancashire, 1922. Jour. Nat. Inst. Agric. Bot. 1: 36–44. 1922.—Synonymous varieties among lots of seed potatoes received for trial against wart disease are listed together, and the reaction of each lot to the disease is given. This information is followed by lists of varieties of undetermined identity, distinct varieties of doubtful immunity, and distinct varieties susceptible to wart disease.—*Frederick V. Rand*.

1693. PUTTERILL, V. A. Plant diseases in the Western Cape Province. "Vrotpootjie" or "Take-all" of wheat. Jour. Dept. Agric. Union South Africa 8: 602–612. Fig. 1–6. 1924.—This is a discussion of the disease caused by *Ophiobolus cariceti* (B. & Br.) Sacc. The author suggests that where the term "foot-rot" is used for this disease, it should be qualified as "Ophiobolus" foot-rot to distinguish it from other diseases of the same nature. Another foot-rot which has done considerable damage in certain districts is probably identical with the Helminthosporium foot-rot which occurs in Australia.—It has been stated that "take-all" is most prevalent on old lucerne lands; and that it often accompanies the use of ostrich manure as a fertiliser. Farmers have observed that good rains on the ploughed land some time before planting, seem to diminish the amount of the disease. This is probably due to active growth of the fungus after the rains and its subsequent starvation owing to the absence of suitable plants for attack.—Control consists chiefly in crop rotations, which are given; and in the clearing off of such grasses as *Bromus sterilis* and *Hordeum murinum* on which the fungus can grow.—A general description of the fungus, its distribution, etc., are given.—*L. I. Goldblatt*.

1694. PUTTICK, G. F. Covered smut (*Tilletia tritici*) in wheat. The value of different control methods. Jour. Dept. Agric. Union South Africa 8: 616–622. 6 fig. 1924.—Covered smut or bunt of wheat is widely distributed in South Africa. The writer discusses the effectiveness of the different methods of treating bunt-infected seeds, and the effects on germination, etc., as observed from experiment. The copper carbonate dust method is undoubtedly superior to any other treatment. In the present experiment the grain was treated by shaking it with the dust in a small vessel. An old butter churn was found very convenient and effective, and its efficiency was increased by providing galvanised iron projections inside the churn which serve to mix the grain more thoroughly. By churning for 1 minute the grain becomes thoroughly coated with the dust which is used at the rate of 7 ounces to 200 pounds.—Observations on dusted grain in the laboratory seem to indicate that weevils and moths do not infest it readily, and that rats and mice are less liable to touch it.—*L. I. Goldblatt*.

1695. REED, GEORGE M. The smuts of cereals: their nature, economic importance and the significance of recent discoveries. Brooklyn Bot. Gard. Rec. 13: 103–124. Fig. 1–7. 1924.—This is a popular, illustrated account based upon investigations carried on at the Brooklyn Botanic Garden since 1921 and still in progress.—*C. S. Gager*.

1696. ROSE, DEAN H. Leather rot of strawberries. Jour. Agric. Res. 28: 357–376. Pl. 1–2, fig. 1–6. 1924.—The destructive disease of strawberries called "leather rot" from the characteristic appearance of attacked fruit, causes serious loss to growers in various states of the southern Mississippi Valley. The pathogenic organism is found to be identical with *Phytophthora cactorum* (Leb. et Cohn) Schroeter, known to attack several other plants, but not previously reported on strawberries in the U. S. A. Growth of the fungus in culture and results of inoculations are described in detail. The close relation of leather rot to rainfall is

noted. Spraying and dusting, and the effect of mulching are being tested for possible control of the disease.—*Edith K. Cash.*

1697. ROULLARD, FRED P. Dormant spraying of vines useless. Associated Grower 51:6. 1923.—It is useless to apply a dormant winter spray to control oidium or powdery mildew of the grape [*Uncinula necator* (Schw.) Burr.]. It is impossible to kill the resting or winter spores with a spray application as they are inaccessible. The time to sulphur is just as the spores germinate in spring. Later sulphurings to prevent reinfection are also necessary. Sulphur dust, when properly applied, is the best and cheapest control. Winter sprays, although an aid in some ways, are likely to be largely negative in results.—*E. L. Overholser.*

1698. ROULLARD, FRED P. Sulphur is only remedy for mildew [*Uncinula necator* (Schw.) Burr.]. Associated Grower 53: 16. 1 fig. 1923.—In the San Joaquin Valley, California, in early spring and summer oidium or powdery mildew has become increasingly prevalent. Sulphur will control it if applied properly. Each grain of sulphur controls but a very minute area; the sulphur must thus be applied to every portion of the vine. Very finely divided sulphur applied dry, or in wettable form may be used. Wettable sulphur mixed with a spreader in water and sprayed on the vine sticks better than does dry sulphur blown on the vine.—*E. L. Overholser.*

1699. SCOTT, C. EMLÉN. Diseases of alfalfa in California. Monthly Bull. California Dept. Agric. 12: 151-152. 1923.—The diseases reported are leaf-spot (*Pseudopeziza medicaginis*), rust (*Uromyces medicaginis*), root-rot (*Sclerotinia trifoliorum*), crown-wart (*Urophlyctis alfae*) and downy mildew (*Peronospora trifoliorum*).—*Lillian C. Cash.*

1700. SMITH, F. E. V. Three diseases of cultivated mushrooms. Trans. British Mycol. Soc. 10: 81-97. Pl. 4-5. 1924.—Mushrooms infected by *Mycogone perniciosa* are usually deformed. This parasitic fungus is distributed by infected soil or spawn, each mushroom, as a rule, being infected directly from the soil at an early stage of its development. This disease may be controlled by fumigation or by spraying with formalin or lysol, as well as by soil sterilization. A disease very similar to the *Mycogone* disease is caused by *Cephalosporium Constantinii* which is described as new. Another species, *C. lamellaecola*, also described as new, produces a fasciation and mildewing of the gills of mushrooms. The name "gill mildew" is proposed for this disease.—*W. B. McDougall.*

1701. TORO, RAFAEL A. Una enfermedad importante de las Cebollas en Puerto Rico. [An important onion disease in Porto Rico.] Porto Rico Insular Exp. Sta., Circ. 71. 1-6. Fig. 1. 1923.—*Macrosporium parasiticum* Thüm. was found by the author attacking onions (*Allium cepa*) on the northern part of the island of Porto Rico. The damage is estimated at 85% of the total crop expected. This disease is also important because it marks a new addition to the geographical distribution of the fungus.—*Mel. T. Cook.*

1702. VAN KEULEN, K. Ramularia lactea, oorzaak van een bladvlekkenziekte der viooltjes. [R. lactea, cause of leaf blotch disease of violets.] Tijdschr. Plantenz. 30: 123-124. 1924.—The disease is very injurious to cultivated plants of *Viola tricolor maxima* and is apparently carried over with the seed. It is more severe in wet than in dry seasons. Spraying several times during the summer with Burgundy-mixture controlled the disease.—*D. Atanasoff.*

1703. WALTON, R. C. Dusting and spraying for disease control in Pennsylvania, 1922. Crop Protection Digest Bull. 1. 19-28. 1924.—Liquid lime sulphur was superior to sulphur dust in all cases for control of apple scab, and also for fruit spot, sooty blotch and frog-eye leafspot. Sulphur dust was superior to copper dust in scab control but inferior in fruit spot control. The addition of Kayso to the lime sulphur spray was of no advantage against scab and fruit spot, but was slightly better for sooty blotch. The 4 weeks' spray was the most valuable single application for controlling fruit spot and sooty blotch.—*F. D. Fromme.*

1704. WENIGER, WANDA. Ergot and its control. North Dakota Agric. Exp. Sta. Bull. 176. 1-23. Fig. 1-12. 1924.—This disease (*Claviceps purpurea*) is discussed from the standpoints of cause, symptoms, hosts, developmental conditions and control measures. Data are given indicating the relation of June precipitation to prevalence of the disease. In North Dakota there is marked difference in susceptibility: (1) amber durums are very susceptible; (2) red durum, Marquis, Red Fife and Ruby are not very susceptible; and (3) Bluestem, Preston and Kota are seldom attacked. A combined salt-formaldehyde treatment of grain for ergot removal acted injuriously; the 2 treatments must be given independently.—*L. R. Waldron.*



1705. WILTSHIRE, S. P. Studies on the apple canker fungus. II. Canker infection of apple trees through scab wounds. *Ann. Appl. Biol.* 9: 275-281. *Pl.* 12. 1922.—*Nectria galligena* sometimes enters apples through young scab (*Venturia inaequalis*) infections on the bark of twigs. The conidia of *N. galligena* germinate in cracks in the bark produced by the scab fungus in moist autumns, and the mycelium grows on the scab stroma, eventually producing conidia. The scab fungus is said to penetrate cork layers formed below it. *Nectria* cannot do this independently but appears to follow the scab fungus, and finally predominates. Strands of mycelium of *Nectria* often consisting of from 20 to 30 hyphae, are formed, and these radiate out from the scab pustule. If the cork layer is not fully formed, the hyphae push between the cells and through the middle lamellae. When the fungus has penetrated the cork layer, the host sometimes forms a 2nd phellogen, but the hyphae penetrate this layer also if cork has not yet been formed. The fungus secretes some substance which attacks the cell walls of the cortical cells. It may spread rapidly in the cortex, the cells of which are stimulated to rapid division. Intercellular spaces are obliterated. Unless protected by cork, these cells also become infected. The host continues its attempts to form cork. Sometimes the phellogen cells hypertrophy so strongly that the tissues are ruptured. If the fungus penetrates to the wood, its growth may be limited somewhat by wound wood, consisting of medullary ray-like cells, in the pits of which gummy material accumulates, thus making penetration difficult. Ultimately cork is formed around the infected cortical tissues and the characteristic canker appearance is produced. This type of infection is not so common as that through leaf scars, but it is as common as that through woolly aphid galls. It is suggested that spraying immediately after defoliation may be effective.—*E. C. Stakman.*

1706. WIMMER. Fortschritte auf dem Gebiete der Bekämpfung von Pflanzenschädlingen. [Progress in combating plant enemies.] *Forstwiss. Centralbl.* 46: 493-495. 1924.—A liquid colloidal sulphur, "Cosan," has proved efficacious in spraying various leaf mildews, including *Microsphaera alni* var. *quercina*, a serious enemy of oaks.—*W. N. Sparhawk.*

1707. WINSTON, JOHN R. La enfermedad de la verruga de los citros. [Citrus scab.] *Defensa Agrícola* [Uruguay] 5: 27-42. 17 fig. 1924.—This is a partial reprint of U. S. A. Dept. Agric. Bull. 1118, by John R. Winston.—*John A. Stevenson.*

#### DISEASES CAUSED BY BACTERIA

1708. BRYAN, MARY K. Bacterial leafspot of *Delphinium*. *Jour. Agric. Res.* 28: 261-270. *Pl.* 1-4. 1924.—This paper describes the black-spot of *Delphinium*, gives its geographical distribution and a description of the causal organism, *Bacterium Delphinii* (E. F. S.), and suggests methods of control. The disease is characterized by the formation of tarry, black spots on the leaves and occasionally on stems and flower buds. These may be 1 cm. across and so numerous as to occupy almost the entire blade of the leaf. The bacteria enter the plant tissues by way of the stomata and water pores. Blackspot is confined to the northern states east of the Mississippi, being most prevalent in the North Atlantic States. This is in agreement with the fact that *Bact. Delphinii* does not grow at high temperatures. This disease has not been found attacking any other plant and inoculations on *Ranunculus*, *Aquilegia* and aconite have not produced infections.—For control it is suggested that all diseased material be collected and burned and that Bordeaux mixture be used as a spray for plants and surrounding soil before the disease appears in the spring and during the growing season.—*Author.*

1709. LEONARD, LEWIS T. Effect of moisture on a seed-borne bean disease. *Jour. Agric. Res.* 28: 489-497. *Fig.* 1-4. 1924.—This work is a continuation of experiments previously reported in the same journal, dealing with the relation of moisture to the development of a bean disease caused by *Bacterium flaccumfaciens*. Under dry land, irrigated and humid conditions, the possible effect on this disease of the practice of treating bean seed with cultures of legume bacteria prior to planting, is given special consideration. It is found that plants from bean seed infected with this organism are quite generally adversely, although usually very slightly, affected by applications of moisture. To a large extent this effect may be avoided by the proper culling of bean seed or by the application of legume bacteria in dry soil.—*Author.*

1710. MILLARD, W. A. Common scab of potatoes. Part II. *Ann. Appl. Biol.* 10: 70-87.

Pl. 3-4. 1923.—Additional experimental evidence on the effect of green manure and of lime is given to support the "preferential food" theory set forth in an earlier article. [See Bot. Absts. 13, Entry 6684.] The various theories advanced to explain the presence or absence of scab are discussed at length.—J. G. Leach.

1711. PAINE, SYDNEY G., AND W. F. BEWLEY. Studies in bacteriosis. VIII. Further investigation of the "stripe" disease of tomato. Ann. Appl. Biol. 10: 89-95. 1923.—The pathogene of the stripe disease of the tomato also causes a number of "streak" diseases of other plants; namely, sweet pea, culinary pea, broad bean, French bean, red clover, lucern, vetch, sainfoin and potato. Some evidence is presented to show that the disease may be transmitted with the tomato seed.—J. G. Leach.

1712. PELTIER, G. L. Further studies on the susceptibility to citrus canker of different species of hybrids of the genus *Citrus*, including the wild relatives. Jour. Agric. Res. 28: 227-239. 1924. [For abstract see this issue, Entry 1462.]

1713. PELTIER, GEORGE L., AND WILLIAM J. FREDERICH. Further studies in the relative susceptibility to citrus canker of different species and hybrids of the genus *Citrus*, including the wild relatives. Jour. Agric. Res. 28: 227-239. 1924.—This is a summary with addition of previous work [see Bot. Abst. 1, Entry 924; 6, Entry 1955]. The following rutaceous plants were found to be non-susceptible to *Pseudomonas Citri* both in the greenhouse and in the field: *Melia azedarach*, *Xanthoxylum bungei*, *Xanthoxylum* sp., *Toddalia asiatica*, *Glycosmis pentaphylla*, *Balsamocitrus dawei*, *Aeglopsis chevalieri*, *Triphasia trifolia*, and *Severinia burifolia*.—A few small infections, mostly at wounds, were obtained in the greenhouse with *Chalcas exotica*, *Feronia limonia*, *Citropsis schweinfurthii*, and *Fortunella crassifolia*.—Small infections, mostly at wounds, were obtained both in the greenhouse and in the field on *Casimiroa edulis*, *Aegle marmelos*, *Feroniella lucida*, *Fortunella margarita*, and *F. japonica*.—The following plants proved susceptible enough both in the greenhouse and in the field, to indicate that they might become infected in their natural habitat, providing a source of inoculum existed: *Chaetosperrum glutinosum*, *Paramignya monophylla*, *Hesperethusa crenulata*, *Eremocitrus glauca*, *Atalantia citrioides*, *A. ceylonica*, *Microcitrus australasica*, *M. australis*, *M. Garrowayi*, *M. australasica* var. *sanguinea*, and *Fortunella hindsii*.—None of the wild relatives mentioned above are susceptible enough to constitute a menace to the citrus industry of the U. S. A. *Poncirus trifoliata* is the only plant belonging to this group which is used at all extensively in the Gulf Coast States. It is highly susceptible to citrus canker. Little or no further changes were noted in the behavior of the various members among the citrus fruits beyond those already reported. The 2 forms of *Citrus hystrix* still maintained their characteristic behavior towards citrus canker, the pointed leaf form being somewhat resistant while the round leaf form was extremely resistant. The Hirado Buntan and Siamese pummelos have shown some resistance to citrus canker. Likewise, all the plants belonging to the *Citrus nobilis* group show resistance to canker. There appears to be no difference between the relative susceptibility of the Owari and Ikeda strains of Satsumas.—*Citrus mitis* and the Kansu orange are about as resistant to canker as the plants of the *Citrus nobilis* group.—Among the hybrids, all the *Poncirus trifoliata* crosses are susceptible. The citrangequat has consistently proved very resistant to canker and appears to be the most promising canker-resistant hybrid so far found. All grapefruit crosses are susceptible, although the tangelo, satsumelo, and some members of the siamelo show enough canker resistance to group them with the satsumas. Likewise, the limequat and orangequat can be regarded as canker-resistant as Satsuma.—G. L. Peltier.

1714. PETRI, L. I tumori batterici del Pino d'Aleppo. [Bacterial tumors of the Aleppo pine.] Annali R. Ist. Superiore Forest. Nazion. Firenze 9: 1-43. Pl. 5-11, fig. 1-19. 1924.—Petri in studying the cause of tumors on *Pinus halepensis* claims that the crown gall disease of E. F. Smith is of the nature of a granuloma rather than a malignant neoplasm. This author describes an intracellular bacterium of the *Pseudomonas* type which he finds in tumors of the Aleppo pine. He renames this organism *Pseudomonas pini* (Vuil.) Petri. The bacteria live in an inactive state in the cells of the neoplasm. Their rejuvenescence results in the breaking down of the cells and the formation of lysigenous lacune where the bacteria develop. The inactive state of the bacteria and the formation of strands of tissue make this type of neoplasm like that of crown gall.—Artificial inoculations have so far been ineffective in bringing about



the formation of tumors. The exudation of resin induced by inoculating young branches is responsible for this failure. Inoculations with small pieces of tumor tissue have likewise given negative results.—Measures to prevent this disease in pines used for ornamental purposes should be directed against aphids and other organisms which may be associated with the spread of the disease. Chemotherapeutic measures directed against bacteria and insects have already been initiated. Small quantities of Te, Se, U, Th, and As have been injected into branches to determine their power to protect the branches against the parasite and its carriers. Petri's future work along this line will be directed toward the study of the ecological conditions which make *Pinus halapensis* susceptible to this organism and the insect carriers.—*Michael Levine*.

1715. SMITH, ERWIN F. **Production of tumors in the absence of parasites.** *Archiv. Dermatol. & Syphilol.* 2: 176–180. 1920.—The author produced hyperplasias (1) by direct application of dilute acids and alkalis to susceptible plant tissues; (2) by introduction into the tissues of foreign organisms, particularly *Bacterium tumefaciens* which produces acids and alkali in culture and presumably also within the host cells; and (3) by limiting the intake of O<sub>2</sub> by the host, thus compelling the cells to furnish their own stimulus leading to hyperplasias. "Probably overgrowths due to freezing and to mechanical injuries will also be found to depend on local interference with cell respiration."—*Frederick V. Rand*.

#### DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

1716. BODENHEIMER, F. S. **The Coccidae of Palestine.** *Zionist Organiz. Inst. Agric. Nat. Hist. Agric. Exp. Sta. Bull.* 1. Published with the Cooperation of the P. Z. E. Depart. Agric. and Colonization. 48 p., 12 pl. Tel Aviv, Palestine, 1924.—Sixty-five species have been discovered, including 8 new species. The natural enemies of the Coccidae of Palestine are spoken of and the methods of control described. Keys and full descriptions of all the species are given and the names of the host in each case. Twelve plates with 31 figures are added to exhibit the scale-insects, usually on their hosts.—*John E. Dinsmore*.

1717. CUNLIFFE, N. **Notes on the biology and structure of Myzaphis abietina Walker.** *Quart. Jour. Forest.* 18: 133–141. 1924.—Observations were made in 1922 on this pest of the genus *Picea*. Biological data and a description of the structure are given in an appendix. This aphid has been recorded as living on *Pinus* and *Abies* as well as on *Picea* species; the author, however, found that when larvae, apterous females and alate females were placed on needles of different species of pine, silver fir, larch and Douglas fir, on May 20, in tube cages kept under similar conditions as those containing spruce needles, all died within 7 days.—*P. S. Spokes*.

1718. DAVIDSON, J. **Biological studies of Aphis rumicis Linn. The penetration of plant tissues and the source of the food supply of aphids.** *Ann. Appl. Biol.* 10: 35–54. Pl. 1–2, 4 fig. 1923.—The piercing organ, its mechanism and its relation to the pierced plant tissue are described. In most cases the piercing organ is directed to the phloem vessels although the xylem and other tissue may also serve as a source of food. The piercing organ consists of 2 canals, one of which serves to conduct the plant juices into the pharynx and the other to conduct the saliva into the plant. The saliva can dissolve cell walls, cause plasmolysis, and change starch into sugar; it also reacts with the cell sap to form a sheath about the piercing organ. The piercing organ usually advances intercellularly.—*J. G. Leach*.

1719. GODFREY, G. H. **The alfalfa stem nematode. (Tylenchus dipsaci Kühn.)** *Monthly Bull. California Dept. Agric.* 12: 299–303. 1923.—The parasite occurs in Oregon and California and may cause serious damage. The best control seems to be a fallow for about 3 years or a rotation with crops not susceptible. The organism is described. It is resistant to low temperatures and dry conditions but is susceptible to high temperatures.—*E. L. Overholser*.

1720. LEUKEL, R. W. **Investigations on the Nematode disease of cereals caused by Tylenchus tritici.** *Jour. Agric. Res.* 27: 925–956. Pl. 1–5, fig. 1–2. 1924.—This disease, although known to be present on every continent, seems confined in the U. S. A. to the 5 states: Virginia, West Virginia, North Carolina, South Carolina and Georgia. It attacks wheat, rye, emmer

and spelt. Oats and barley have been found to be practically immune as are also the various grasses. The economic importance of the disease is discussed, and different methods of determining losses are described and compared. A detailed description of the various symptoms is given and also of the galls; their origin and contents are discussed and the differences between galls and other impurities found in wheat dwelt upon. The description and life history of the causal organism are briefly reviewed. Results of investigations on the spread of the disease through various agencies are given. Birds have been found relatively unimportant in this respect. The nematodes do not survive passage through the digestive tract of various domestic animals. They are unable to travel any appreciable distance in the soil by their own efforts. They perish in stored manure. The disease is spread chiefly by means of the galls in the seed. Investigations on the longevity of the organism are given, and also on its reaction to high and low temperatures, desiccation, and chemicals, and the relation of these to control measures.—The disease is controlled by rotation and the use of non-infested seed. Soil infestation may be remedied by the absence of susceptible crops for 1 year. No totally resistant varieties of wheat were found.—*Author*.

1721. MAARSCHALK, H. *Het gebruik van Naphthaline bij den bloembollenexport*. [Use of naphthaline in flower bulbs to be exported.] *Tijdschr. Plantenz.* 30: 99-103. 1924.—For keeping bulbs destined for export free from insects in general and from mites (*Rhizoglyphus hyacinthi* (= *echinopus*)) in particular, the use of naphthaline, which kills the insects but does not injure the bulbs, is recommended.—*D. Atanasoff*.

1722. MILBRATH, D. G. *The rootknot nematode in relation to deciduous fruit trees and grapevines*. *Monthly Bull., California Dept. Agric.* 12: 127-135. *Fig. 53-59*. 1923.—The rootknot nematode (*Heterodera radiculicola*) has become of great economic importance to the fruit industry of California. Losses in orchards and in nurseries have been severe. Overgrowths are caused on the smaller roots. The galls are different from those caused by *Bacterium tumefaciens* E. F. S. and Town. or by *Phylloxera*. A description of the differences is given by the author. Injury to the plant may include serious loss of vitality and even death. Control may be found in resistant or immune root stocks. Some apricots seem resistant. Infestation may come from roots of nursery stock, inter-crops, previous crops, or from flood waters from infested soil. Soil may be treated with  $HgCl_2$  to reduce infestation. The most efficient control consists in prevention of infestation and use of immune root-stocks. Fertilizers have not proved successful as regards control.—*E. L. Overholser*.

1723. NOUGARET, R. L. *Rootknot on grapes*. *Monthly Bull. California Dept. Agric.* 12: 139-150. *Fig. 61-64*. 1923.—Between 1890 and 1900, *Vitis vinifera*, *V. aestivalis* and *V. labrusca* were all reported as hosts of the nematode (*Heterodera radiculicola*) causing rootknot. The life history and characteristics of this nematode are described. It is a serious pest of nurseries. Warm, sandy soils with uniform moisture favor its growth. The best control consists in prevention of infestation and use of resistant stocks. Immune stocks are Salt Creek (*V. champini*), and Solonis × Riparia, 1616. Resistant stocks are Dogridge (*V. champini*), Riparia × Rupestris 101-104 and 120A, Riparia × Cordifolia-Rupestris 106-108, and Solonis × Othello 1613, Salt Creek and Dogridge are poor stocks.—*E. L. Overholser*.

1724. SMITH, C. H. *The stem nematode of alfalfa (Tylenchus dipsaci Kühn) in California*. *Monthly Bull. California Dept. Agric.* 12: 136-138. *Fig. 60*. 1923.—This nematode attacks the stems and leaves of alfalfa and about 100 other hosts, causing a dwarfing and thickening of parts attacked. It is resistant to adverse conditions. With the exception of red clover and strawberry, it does not interchange between hosts readily. Apparently there are several biologic strains of the organism. The chief spread is by irrigation water. The best methods of control are avoidance of over irrigation, crop rotation and summer fallow.—*E. L. Overholser*.

1725. SUNDAR RAMAN, A. H. *A contribution to the study of Indian zooecidia*. (To be continued.) *Jour. Indian Bot. Soc.* 4: 1-17, 35-49. 3 pl. 1924.—This summarizes the work done in India on galls produced by the following families of insects: Aphididae, Acarineae, Cecidomyiidae, Psyllidae and Cynipidae. It includes a characterization of each group and descriptions of the galls on the numerous host plants studied.—*Harry Braun*.



## INFECTIOUS CHLOROSIS (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

1726. ANONYMOUS. **Mosaic disease eradication campaign.** South African Sugar Jour. 8: 523-525. 1924.—No cane grown in Natal except Uba is free from mosaic. In several cases fields of so-called Agaul cane have been found free from the disease, but as this variety is known to be susceptible it is believed that the cane is Uba and not Agaul. The Government is prepared to issue a proclamation making the growing of cane other than Uba illegal in order to eradicate the disease. Until the disease is rooted out, no new varieties can be introduced without running the risk of their becoming infected also.—*Nellie E. Fealy.*

1727. ANONYMOUS. **Mosaic disease of sugar cane.** South African Sugar Jour. 8: 577, 579, 581, 583, 585, 587. 1924.—A brief history of the mosaic disease of sugar cane is given and the symptoms are described.—While some investigators found no loss in tonnage or sucrose as a result of the mosaic disease, heavy losses in sugar output have been reported from Porto Rico, Hawaii, and Jamaica.—The opinion is unanimous that the disease can be restricted by roguing and by the use of healthy seed. The author gives a schedule for inspections and roguing. It is generally believed that where a field is free from danger of outside infection this method is a complete success aside from the question of cost, which in Porto Rico ranged from 50 cents to \$18 per acre. Uba is still the outstanding variety recommended for high productiveness and immunity from mosaic, but the Badilla is also highly resistant and in some respects more desirable than the Uba.—Attention is called to the fact that no definite experiments have been undertaken looking toward control of the agent of transmission, the aphid; and the control of the host grasses, corn and sorghum is suggested as a virgin field for practical research.—*Nellie E. Fealy.*

1728. CARNSER, EUBANKS, AND C. F. STAHL. **Studies on curly-top disease of the sugar beet.** Jour. Agric. Res. 28: 297-320. Pl. 1-5 (1 col.). 1924.—As the title indicates, this report of progress deals with the pathological phases of the problem. The introduction briefly reviews the important advances along this line. The symptoms of the disease are described and its geographical distribution is given. The economic importance of the disease is discussed and figures are given to show the losses which it has in some instances caused. Experimental results are recorded which show that a viruliferous insect does not produce the disease each time it feeds on a healthy plant. Evidence was obtained that an interval of a few hours—an incubation period—must elapse after a nonviruliferous insect has fed on a diseased plant before it can effectively transmit the virus to a healthy plant. The severity of the disease and its incubation period were the same when the inoculation was made with 1 insect as when made with 10. In the absence of light during inoculation, beets are more readily infected through the cotyledons than through the true leaves. The virus is not destroyed by temperatures lower than those which destroy beet tissue. Desiccation seems to destroy the virus. Evidence was obtained that no specific bacterial organism is associated with curly-top. Very young plants are more readily infected than are older plants. A wide range of species has been found susceptible to the disease. The virus probably overwinters in susceptible wild annuals, in volunteer beets, and in the insect vector. Early planting usually avoids much of the injury. There is basis for the belief that a resistant strain of beets may be developed.—*Eubanks Carsner.*

1729. ELMER, O. H. **Studies of insect transmission and cross-inoculation of mosaic on the Solanaceae, Cucurbitaceae and Leguminosae.** Proc. Iowa Acad. Sci. 29: 311-312. 1922. [1924].—By inoculations and carefully guarded experiments with mealy bug (*Dactylopus*), mosaic was transmitted both ways between cucurbits and solanaceous plants. This aphid also transmitted the disease among cow peas.—*H. S. Conard.*

1730. FAWCETT, GEO. L. **La desinfección de la caña por la calefacción.** [The disinfection of cane by hot water.] Rev. Indust. y Agric. Tucuman 13: 205-206. 1923.—An experiment was conducted to test the effect of hot water on sugar cane mosaic. Infected seed pieces of the variety P. O. J. 213 treated 15 minutes at 58°C. and 90 minutes at 50°C. failed to germinate. Cuttings treated 15-90 minutes at 48-50°C. germinated but were still infected with mosaic. This experiment confirms the results obtained by other workers in the U. S. A. and Java.—*John A. Stevenson.*

1731. FAWCETT, GEO. L. **La transmisión del mosaico de la caña.** [Transmission of cane

mosaic.] Rev. Indust. y Agric. Tucuman 13: 129-131. 1923.—The experiments of Brandes and others, demonstrating *Aphis maydis* to be a carrier of sugar-cane mosaic are reviewed. Experiments carried out by the author on a small scale in Tucuman gave negative results.—*John A. Stevenson.*

1732. HANSFORD, C. G. Mosaic disease of canes. Jour. Jamaica Agric. Soc. 27: 864-869. 1923.—The mosaic disease of sugar cane, which entered Jamaica within recent years, has spread rapidly and caused heavy losses, ranging at times from 15 to 45%. Symptoms, means of transmission and control methods are discussed. Roguing of diseased fields and use of disease-free seed as well as use of Uba cane are the measures recommended.—*John A. Stevenson.*

1733. HANSFORD, C. G. Mosaic disease of canes. Jour. Jamaica Agric. Soc. 27: 961-964. 1923.—The mosaic disease of sugar cane has apparently spread more rapidly in those parts of Jamaica where the rainfall is heavy. It is considered practicable to rogue the fields where the infection is 10% or less. When the infection is heavier, the cane should be cut at maturity and the field then replanted with disease-free seed or a resistant variety such as Uba. After 2 seasons the Uba can be replaced by better sugar-producing varieties kept free of mosaic by roguing.—*John A. Stevenson.*

1734. HANSON, A. P. Mosaic disease. Jour. Jamaica Agric. Soc. 28: 242-243. 1924.—The author outlines the symptoms, effects and control measures of the sugar-cane mosaic disease, emphasizing the necessity of not planting corn (maize) between the cane rows.—*John A. Stevenson.*

1735. MUNCIE, J. H. The relation of cucurbit mosaic to wild catnip. (Abstract) Proc. Iowa Acad. Sci. 29: 346. 1922 [1924].

#### PARASITIC PHANEROGAMS

1736. HERBERT, D. A. Parasitism of the Quandong (*Fusanus acuminatus* R. Br.). Jour. and Proc. Roy. Soc. Western Australia 7: 75-76. Pl. 11. 1921.—This plant, native to Western Australia, is a root parasite on *Acacia acuminata*, *Eucalyptus loxophleba* and *Daviesia euphorbioides* or on its own species.—*Wm. Randolph Taylor.*

1737. HERBERT, D. A., AND C. A. GARDNER. Parasitism of the sandalwood (*Fusanus spicatus* R. Br.). Jour. and Proc. Roy. Soc. Western Australia 7: 77-78. Pl. 12. 1921.—This plant is a root parasite on *Acacia acuminata*. The wood is a good substitute for the Indian sandalwood.—*Wm. Randolph Taylor.*

1738. ROLDAN, ANGEL. Los arboles indigenas que ataca el muerdago en el Valle de Mexico. [Native trees attacked by mistletoe in Mexico Valley.] Mexico Forest. 2: 61-63. 1 fig. 1924.—*Phoradendron velutinum* commonly attacks *Crataegus*, *Casimiroa*, *Fraxinus*, *Prunus*, *Quercus*, and *Salix*, while *Alnus acuminata* is the host for *P. brachystachium*. In the mountains of the region, *Arceuthobium cryptopodum* is seriously injuring *Pinus Hartwegii*.—*W. N. Sparhawk.*

#### NON-PARASITIC DISEASES

1739. ALLEN, F. W. Protect peach trees from sunscald. Associated Grower 62: 11. 1924.—The bark assimilates heat on the exposed side and in winter a temperature of 30-40°F. above and in summer 16.9°F. above air temperature may be reached. Such fluctuation in winter kills the cambium layer. The trunks of trees should be protected by a whitewash.—*E. L. Overholser.*

1740. BIRMINGHAM, W. A. A "shriveled" condition of grape berries. Agric. Gaz. New South Wales 35: 669-671. Fig. 1-2. 1924.—This trouble is evidently physiological in character, due to an excessive heat wave immediately following and preceding comparatively cool weather. The damage in some districts was very marked and consisted in a wilting or shriveling of nearly all of the fruit.—*L. R. Waldron.*

1741. RHOADS, A. S. Apple measles, with special reference to the comparative susceptibility and resistance of apple varieties to this disease in Missouri. Phytopathology 14: 289-314. 1924. [For abstract see this issue Entry, 1470.]



1742. SAVASTANO, L. Clorosi costituzionale negli agrumi. [Constitutional chlorosis in citrus plants.] Boll. R. Staz. Sper. Agrumic. e Fruttic. Acireale 36. 1-3. 1919.—The disease manifests itself principally in the leaves, which develop yellowish-green spots along the midrib and between the secondary veins. The spots coalesce and the entire leaf may become yellow, whole branches becoming affected in severe attacks. Chlorosis is more frequent in chalky clay soil. The author recommends severe pruning to invigorate the tree, cutting out branches which are chlorotic, the use of fertilizers containing potassium, and spraying with lime-sulphur.—*Lillian C. Cash.*

1743. SAVASTANO, L. Scottatura negli agrumi. [Winter injury in citrous trees.] Boll. R. Staz. Sper. Agrumic. e Fruttic. Acireale 40: 4-5. 1921.

1744. ȘTEFĂNESCU, D. I. Observațiuni asupra degenerării prunului D'Agen. [The degeneration of the D'Agen plum-tree.] Bul. Agric. [București] 4. 87-111. 13 fig. 1922.—Signs of degeneration are naked branches, short and thick branchlets, broad, shining leaves, a bushy form, heavy bunches of blossoms and very few round plums. No definite parasite has been found. It is probable that in Roumania the degeneration is related to climate and sudden changes of temperature in spring. Rabaté considers it, provisionally, as being due to failure to supply water to all parts of the plant. For new plantations are recommended new, calcareous and pervious soils; stocks well adapted to the soil and grafts taken from sound, vigorous, productive trees, with long leaves and piriform fruit. Seedlings from d'Agen plum-kernels produce good stocks and, without grafting, even new types of d'Agen plum-trees. In Roumania plants from kernels vary considerably. The use of manure, insecticides and fungicides gave no precise results; nevertheless new tests should be made. Plantations in mountainous regions gave poor results in Roumania; on the hills and especially on the plains they are much better.—*E. Pop.*

#### DISEASES OF UNKNOWN CAUSE

1745. ANONYMOUS. Serious nature of cane diseases. South African Sugar Jour. 8: 535. 1924.—A gumming disease of cane has broken out on the Tweed in Queensland, and while the diseased canes are as yet few, a case is cited to show that the disease nearly doubled itself each year, until in the affected area sufficient healthy plants for planting were unobtainable. The seriousness of the disease depends upon the vigor of the steps taken for its control.—*Nellie E. Fealy.*

1746. COMMITTEE OF DIRECTION OF FRUIT MARKETING. The "squitter" trouble. Australian Sugar Jour. 16: 266-267. 1924.—This trouble of bananas is causing considerable loss in Melbourne and Adelaide and having an injurious effect on the banana trade. The center of the affected fruit becomes black and soft and on slight pressure at the shoulder this center squirts out in almost liquid form. Frequently the outside of the fruit appears sound. The trouble is apparently experienced every winter. No district is immune from it and some varieties are almost always affected, while others are practically free. The cause of the trouble is uncertain but it may possibly be due to the ripe-rot fungus. It has been observed that "squitters" develop if bananas are ripened quickly or slowly and the longer the time of ripening the greater the proportion of affected fruit. Professor Goddard, of the Queensland University, is making some experiments with the trouble and will make no definite recommendations until these are completed, but in the meantime suggests dipping the ends of the fruit in a corrosive sublimate solution. Some suggestions are offered to growers for holding the trouble in check.—*Nellie E. Fealy.*

1747. MARLOTH, R. Investigations into the causes of the chlorotic condition of fruit trees in the Wellington District. Union South Africa. Dept. Agric. Sci. Bull. 29. 1-21. Pl. 1-6. 1924.—There are about 5000 trees chiefly in the Wellington district of the Cape Province, affected by this disease which is a very severe form of chlorosis. The leaves show no signs indicating fungoid or bacterial origin though the roots are more or less in a diseased condition.—In the initial stages of the disease the leaves show a more or less diffused yellow color between the veins. Other trees have entire branches discolored in this way, and in such cases most of the new growth consists of dwarfed twigs crowded at the end of old shoots and bearing

small discolored leaves. Some of these trees linger on for years, still producing fruit of inferior quality; others die branch by branch and have to be removed. Owing to the absence of normal lateral shoots the branches of these trees assume a staghorn appearance and can be recognised even in winter when devoid of leaves.—It appears that there are 2 kinds of chlorosis or rather 2 diseases causing chlorosis. In the case of the “kloof” orchards chlorosis is due to the presence of carbonate of soda in the soil. In the hillside orchards, however, the diseased condition of the roots of the affected trees is due to other causes of which the following have so far been noticed: frequent and in some orchards, almost universal, mechanical injury of the roots; fungoid mycelia (probably saprophytic); galls of nematodes (occasionally); alkali salts in the soil; and frequently also crown gall and serious gummosis. The gummy degeneration of the roots is a widespread occurrence and may have been present in the trees when planted. Only further investigation and extensive experimental work can answer this question. The disease may be of the nature of peach yellows. The solution of the problem probably lies in the proper selection of stocks, though in regard to the peach stocks involved in the present experiment no information is available.—*L. I. Goldblatt.*

1748. QUAIRIÈRE, C. J. *Note sur le dépérissement des ormes.* [The withering of elms.] Bull. Soc. Centrale Forest. Belgique 30: 555-559.—The author has reviewed numerous reports from all parts of Belgium and has studied certain cases of the withering of elm twigs, which apparently threatens the existence of *Ulmus montana* in Belgium. No definite explanation of this malady is possible as yet although the epidemic has been under close observation since 1919. *Ulmus campestris* does not seem so susceptible to this withering.—*H. T. Gisborne.*

1749. SAVASTANO, L. *Gommosi secca negli agrumi.* [Dry gummosis in citrus plants.] Boll. R. Staz. Sper. Agrumic. e Fruttic. Acireale 41. P. 5-7. 1921.—This gummosis differs from the ordinary form in having no external exudation of gum. In the early stages the cambium and adjacent tissues are impregnated with a dark gummy substance, which diffuses longitudinally along the trunk and branches and to some extent laterally also. The bark soon becomes dry, shrivelled and dark and the affected branches die.—*Lillian C. Cash.*

1750. SAVASTANO, L. *Sul marciume radicale negli agrumeti italiani.* [Root-rot in Italian citrus plantations.] Boll. R. Staz. Sper. Agrumic. e Fruttic. Acireale 35. 1-15. 1 fig. 1919.—No organism has been found to cause the rot, which varies in intensity in different seasons and is most severe in water-logged soils of low ploughed land. The article mentions contributing causes, curative measures, the relation of various types of citrus to rot, drainage of large plantations, decrease in resistance, replanting diseased trees and strengthening the sour orange stock.—*Lillian C. Cash.*

1751. SAVASTANO, L. *Sulla gommosi secca o mal secco degli agrumi.* [Dry gummosis of citrus plants.] Boll. R. Staz. Sper. Agrumic. e Fruttic. Acireale 42. 1-7. 9 fig. 1921.—This gummosis is a disease starting in the green twigs and spreading into the branches and trunk, finally causing the death of the tree. It resembles that ascribed by H. A. Lee to *Bact. citrarefaciens*, but the etiology has not yet been worked out.—*Lillian C. Cash.*

## GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

1752. ANONYMOUS. [Colloidal copper hydroxide.] South African Sugar Jour. 8: 515. 1924.—According to H. D. Hooker, University of Missouri, colloidal copper hydroxide has given remarkably promising results as a fungicide as compared with Bordeaux mixture and lime-sulphur wash. The weakest concentration used, 0.019% afforded complete protection against both scab and blotch and produced much less burning than Bordeaux mixture and very little more than lime sulphur. An even more dilute concentration may give adequate protection and no burning.—*Nellie E. Fealy.*

1753. ANONYMOUS. *La gomosis del limón.* [Lemon gummosis.] Defensa Agrícola [Uruguay.] 5: 3-5. 1 fig. 1924.—The gummosis disease of lemons, which is prevalent in Uruguay, is briefly described and suggestions for control are made.—*John A. Stevenson.*

1754. ANDERSON, H. W. *Notes on new diseases of economic crops in Illinois.* Illinois Acad. Sci. Trans. 15: 130-140. 1922.—This is a record of miscellaneous observations on diseases. The diseases included are: (1) Leaf spot of China aster (*Septoria callistiphi*), common



in the University greenhouse; (2) leaf spot of *Sedum spectabilis* caused by *Septoria Sedi*; (3) spinach mosaic on spinach from near Belleville where it was reported as causing considerable damage; (4) powdery mildew (*Sphaerotheca humuli* (?)) on blackberry, previously reported on dewberry by Burrill; (5) dodder on raspberries; (6) Strumella canker on oak; (7) rust (*Puccinia recedens*) on *Calendula*; (8) anthracnose (*Colletotrichum lagenarium*) on edible gourd; and (9) strawberry leaf scorch (*Mollisia earliana*). Rough bark of apple is reported as not due to *Phomopsis mali*. This fungus is common on apple twigs and is not regarded as of any economic importance.—H. W. Anderson.

1755. ARKWRIGHT, JOSEPH A. "Virus diseases" of animals. Ann. Appl. Biol. 10: 55-69. 1923.—This is a general and theoretical discussion of the known facts about the nature of virus diseases of animals and plants. The Rickettsia bodies of Rocky Mountain fever, typhus and trench fever, and the bacteriophage of d'Herelle are discussed in their relation to the cause of virus diseases.—J. G. Leach.

1756. BEAUVERIE, J. L'Histoire de la phytopathologie. [Rev. of: WHETZEL, HERBERT HICE. An outline of the history of phytopathology. 130 p., 22 portraits. W. B. Saunders Co. Philadelphia, 1918.] Rev. Gen. Sci. 34: (1-14). 1923.—The reviewer says, in translation: This work, largely synthetical and philosophical, appears to us symptomatic of a temper rather new perhaps in the savants [phytopathologists] of America, more inclined to the study of questions of an immediate practical interest, a new spirit of which the works of Erwin F. Smith have set the most brilliant standard.—This history of phytopathology is divided into the following eras: Ancient, dark, premodern, modern, and present. The last 3 are discussed by the reviewer in some detail.—Frederick V. Rand.

1757. [DORMER, COTTRELL.] Cane diseases in Lower Burdekin areas. (From: Rept. to the Director, Bur. Exp. Stations.) Australian Sugar Jour. 16: 231-234. 1924.—Top rot and leaf stripe, 2 very serious diseases of cane, were found throughout the Lower Burdekin districts. In the majority of cases top rot [cause not stated] was worst in fields in which the watering had been neglected at some time and in late-planted fields. The Badilia variety of cane was most affected, while Clarke's Seedling, Brown Goru, and B. 208 were the most resistant of the varieties widely grown. The author does not believe that this disease is spread by planting and gives evidence to sustain his view. Leaf stripe (*Sclerospora sacchari*) seemed to be confined almost exclusively to B. 208. Blocks in which this disease is prevalent should be plowed out as soon after cutting as possible. The disease is very infectious.—Grubs and other insect pests, and the "cane stunting weed" are also discussed.—Nellie E. Fealy.

1758. DRAYTON, F. L. (Editor). Survey of the prevalence of plant diseases in the Dominion of Canada, 1923. Dominion of Canada Dept. Agric., Experimental Farms Br. Ann. Rept. 4: 1-133. [Mimeographed.] Ottawa, 1924.

1759. FROMME, F. D., AND F. J. SCHNEIDERHAN. Cooperative dusting and spraying experiments in 1922. Crop Protection Digest Bull. 14: 1-14. 1924.—This is an introductory statement of the plan of work preceding detailed reports by cooperators.—F. D. Fromme.

1760. GIACCONE, VICENTE. Enfermedades de la papa. [Potato diseases.] Defensa Agricola [Uruguay] 4: 84-86. 1923.—The potato diseases due to *Phytophthora infestans*, *Entorrhiza solani*, *Bacillus solanacearum* and *Sclerotinia libertiana* are described and control measures given.—John A. Stevenson.

1761. GILMAN, J. C. Effect of hardness of water on the fungicidal value of mercuric chloride solutions. (Abstract.) Proc. Iowa Acad. Sci. 29: 347. 1922 [1924].

1762. GRAM, ERNEST, AND SOFIE ROSTRUP. Oversigt over Sygdomme hos Landbrugets og Havebrugets Kulturplanter i 1923. [Plant diseases and other pests in Denmark during 1923.] Tidsskr. Planteavl. 30: 361-412. 1924.—This report covers the period from Oct. 1, 1922 to Sept. 30, 1923. The summer was unusually cool while the winter was mild. Both *Pleospora graminea* and *P. teres* were common on barley. On account of the established practice of seed treatment, *Tilletia tritici* is no longer a problem. Oats and barley were damaged by *Heterodera Schachtii*; and wire worms (*Agriotes lineatus*) injured wheat and rye. *Pythium de baryanum* was common. Cabbage and cauliflower were damaged by *Bacterium maculicolum* and *Chortophila brassicae*.—Carrots were affected by the unusual fungus, *Alternaria brassicae* var. *dauci*, and by *Trioza viridula*. The latter was controlled with 0.1% nicotine sulphate, which

was also found effective against aphids. Mosaic diseases were common on garden plants. Red clover was attacked early by *Gloeosporium caulivorum*. *Nectria galligena* occurred on apples growing on acid soils. *Nectria cinnabarina* was conspicuous on shade trees following primary infection by *Phoma oblonga*. Nicotine and arsenical sprays destroyed flea beetles, *Phyllotreta* spp. The best control for *Bryobia ribes* was found to be a lime-sulphur dormant spray. The eggs of *Paratetranychus pilosus* were effectively destroyed with a 5% Gargoyle spraying oil.—*Albert A. Hansen.*

1763. GREIG, J. RUSSELL. Note on the association of *Tilletia Tritici* with "epileptiform convulsions" in the dog. Trans. British Mycol. Soc. 10: 121-122. 1924.—In 3 cases of dogs showing epileptiform symptoms, large numbers of spores of *Tilletia Tritici* were found in the feces. In 2 of these cases the spores were also found in the urine and in 1 in smear preparations from the cerebral cortex. It is suggested that these spores may be a factor in the production of epileptiform convulsions.—*W. B. McDougall.*

1764. HERTIG, MARSHALL, AND S. BURT WOLBACH. Studies on Rickettsia-like micro-organisms in insects. Jour. Med. Res. 44: 329-374. 4 pl. 1924.—A large number of species of insects were examined to determine the incidence of rickettsia-like organisms. Minute micro-organisms, morphologically and tinctorially similar to the pathogenic rickettsiae, were found to be widely distributed in arthropods, without relation to their feeding habits. The nature and classification of the micro-organisms is discussed at length. The term "Rickettsiae" is held to be a loose but convenient group name for certain minute micro-organisms associated with arthropods, but it is proposed to restrict the term "to proved pathogenic micro-organisms having the following characteristics: Small size, pleomorphism, slight affinity for aniline dyes, and intracellular habitat." A tabular summary of the known rickettsia-like organisms is included.—*J. G. Leach.*

1765. HUNT, CHAS. M. Spraying to produce quality fruit. Citrus Indust. 5<sup>o</sup>: 5-8. 1924.—This is a discussion of the commercial spraying of Florida citrus groves with reference to the cost of spraying, the 4 spraying periods of the year, and the various diseases and insects to be controlled.—*Arthur S. Rhoads.*

1766. MORSTATT, H. Bibliographie der Pflanzenschutz-literatur das Jahr 1923. [Bibliography of plant-protection literature for 1923.] Biologische Reichsanstalt für Land- und Forstwirtschaft in Berlin-Dahlem. 176 p. Paul Parey-Julius Springer: Berlin, 1924.—This is an extensive bibliography of books and papers on plant pathology appearing in 1922 and 1923, and includes the following phases: pathological anatomy and physiology, epidemiology, parasitism, non-parasitic diseases, diseases of unknown cause, plants and animals as causal agents, diseases arranged according to crops, plant hygiene and therapy, statistics and laws relating to plant disease control.—*Harry Braun.*

1767. NAVARRETE, M. La gomosis de los naranjos. [Gummosis of oranges.] Defensa Agricola [Uruguay] 4: 86-87. 1923.—The citrus disease, known as gummosis, is described and control measures are indicated.—*John A. Stevenson.*

1768. NOFFRAY, F. Peligros de los parasitos de las plantas adventicias. [Danger from parasites of adventitious plants.] Defensa Agricola [Uruguay] 5: 42-44. 1924.—The author points out the danger of weeds and native plants permitted to grow in and about gardens and fields, serving as hosts for parasitic fungi which are capable of attacking economic plants. A number of examples are cited and directions for the control of such conditions outlined.—*John A. Stevenson.*

1769. OCFEMIA, G. O. Notes on some economic plant diseases new in the Philippine Islands. Philippine Agric. 13: 163-166. 1924.—An anthracnose of mango (*Mangifera indica* L.) is caused by *Gloeosporium* (possibly *G. mangiferae* Henn.). An anthracnose of abaca (*Musa textilis* Née) resembles that of banana (*Musa sapientum* L.) and is caused by *Gloeosporium* sp. An anthracnose of pepper (*Capsicum annuum* L.) resembles that caused by *Colletotrichum nigrum* E. and H. A mosaic disease has been found in pechay or Chinese cabbage (*Brassica pekinensis* (Lour.) Skeels), and another in balsam (*Impatiens balsamina* L.). Two fruit rots of pineapple (*Ananas comosus* (L.) Merr.) have been found, the 1st due to a species of *Thielaviopsis* resembling *T. paradoxa*, and the 2nd being a brown rot. Rots caused by a *Sclerotium* (of the *rolfsii* group) have been observed in peppers and tomatoes (*Lycopersicon esculentum* Mill.)—*Sam F. Trelease.*



1770. OLIVE, CHARLES. Four diseases of apples in storage. *Amer. Fruit Grower* 44<sup>10</sup>: 34. 1924.—The importance of storage diseases in taking a heavy annual toll on the harvested crop of apples is pointed out and the following diseases, Jonathan spot, anthracnose, blue mold, and frost bite, which the author has found quite general on the Pacific Coast and in the Middle Atlantic States, are discussed.—*Arthur S. Rhoads*.

1771. ORTON, W. A. The distribution of disease-resistant, disease-free, and disinfected seed by the seed trade. *Proc. 41st. Ann. Conv. Amer. Seed Trade Assoc. P. 63-68*. 1923.—Seedsmen are advised to promote the control of plant diseases by the sale of disease-resistant varieties, particularly rust-resistant asparagus, yellows-resistant cabbage, wilt-resistant cotton, flax, etc. The  $HgCl_2$  treatment of cucumber seed is recommended to wholesalers as a general practice; and the hot water treatment of cabbage seed, with reservations. No general treatment for all seed has been devised. The aging of celery and cotton seed to eliminate fungus infection is advised. Seedsmen were urged to connect more closely with the seed certification movement, and to secure the extension of certification based on field inspection to other seed than potatoes. The need of more research is emphasized.—*Author*.

1772. ORTON, W. A., AND G. H. GODFREY. Dissemination of plant diseases by contaminated seed. *Monthly Bull. California Dept. Agric.* 12: 297-299. 1923.

1773. POLLACCI, GINO E ARTURO NANNIZZI. I Miceti patogeni dell'uomo e degli animali. [Fungi pathogenic to men and animals.] Fasc. I. 48 p. 26 fig. *Illus.* Fasc. II. 52 p. 44 fig. *Stab. Arti Grafiche S. Bernardino*: Siena, 1922-1923.—The diseases of men and of animals caused by fungi are probably more numerous than is generally supposed. It is the aim of the authors to publish fascicles at regular intervals. Each fascicle contains 10 well stained microscopic slides and is accompanied by an extensive description of the fungus, symptoms of the disease figures and photographs of the fungi and of the infested organs of men or animals. Fascicle I contains No. 1-10: *Achorion Schönleinii*, *Actinomyces bovis*, *Aspergillus fumigatus*, *Microsporon dudguini*, *Mucor corymbifer*, *Penicillium brevicaulis*, *Saccharomyces albicans*, *Sporotrichum Beurmannii*, *Trichophyton (Gypseum) asteroides*, *Trichosporium Mantegazziae*. Fascicle II contains No. 11-20: *Haploglyphium de Bellae-marengoi*, *Hemispora stellata*, *Monilia tropicalis*, *Monosporium apiospermum*, *Oospora d'agatae*, *Saccharomyces neoformans*, *Strigimatacystis nigra*, *Trichophyton granulosum*, *T. violaceum* and *Trichosporon Beigelii*.—*J. C. Th. Uphof*.

1774. SAVASTANO, L. Di talune pratiche colturali nel marciume radicale degli agrumi. [Cultural treatment of root rot of citrous plants.] *Boll. R. Staz. Sper. Agrumic. e Fruttic. Acireale*. 38. 1-7. 1921.—The article discusses mainly drainage and irrigation ditches.—*Lillian C. Cash*.

1775. SAVASTANO, L. Scortecciamento traumatico degli agrumi. [Bark injury in citrous trees.] *Boll. R. Staz. Sper. Agrumic. e Fruttic. Acireale*. 39. 1-4. Fig. 1-3. 1921.—The article discusses mechanical injury.—*Lillian C. Cash*.

1776. [SCHOENE, W. J.] Recent amendments to the crop pest law. *Quart. Bull. Virginia Crop Pest Commission*. 6<sup>2</sup>: 1-4. 1924.—This contains amendments to the crop pest law providing for legal cutting of 2nd growth cedars, and for an increase in the levy on apple orchards in Shenandoah County to provide funds for cedar eradication. Not more than 3 dollars per acre may be levied in any year on orchards planted 10 years or more and not more than 1 dollar and 50 cents per acre on orchards planted more than 2 years and less than 10.—*F. D. Fromme*.

1777. TALTON, E. H. Citrus fruit arriving on the market. *Citrus Indust.* 5<sup>9</sup>: 13, 21. 1924.—This is a discussion of picking, hauling, packing and packing house machinery, loading, fertilizing, and harvesting of Florida citrus fruit considered in relation to their bearing on the condition of the fruit upon arriving on the market.—*Arthur S. Rhoads*.

1778. TAPKE, V. F. Effects of the modified hot-water treatment on germination, growth, and yield of wheat. *Jour. Agric. Res.* 28: 79-98. Pl. 1-5. 1924.—The effects of the modified hot-water treatment on the germination of seed wheat were governed by the physical condition of the seed coats. The germination of treated seed with unbroken coats was retarded but not reduced. Total and normal germination were severely reduced when the seed coats were broken at designated places over the endosperm. When seed coats were broken over the

embryo, total germination was reduced to 5% or less and normal germination to zero. Machine-thrashed seed-lots usually contained high percentages of broken seed coats. The average soil germination of 58 different lots representing 32 distinct varieties was 33.3% less for the treated than for the untreated wheat. Some evidence seems to indicate that the injurious action of treatment on surviving seeds may extend into later stages of growth. Yield experiments covered 3 years. Plants from untreated seed outyielded plants from treated seed except when the treated seed were sown at a rate compensating treatment injury, but the plants from untreated seed contained a relatively high percentage of loose smut. A soil which reduced the yield of plants from untreated seed by 1.3 bushels per acre, reduced the yield of plants from treated seed by 5.3 bushels per acre.—*Author*.

1779. TEHON, LEO R. **The Illinois plant disease survey.** Illinois Acad. Sci. Trans. 15: 141-150. 1922.—The purpose of the newly organized plant disease survey of the State Natural History Survey is to ascertain what diseases occur within the state, to study their distribution and to determine the extent of damage. Attention is given to diseases in proportion to their economic importance. A summary of the 1st season's work is given. On account of the fact that no work was done previous to July 1921, many of the early maturing crops had to be neglected. A list is given of diseases of fruits, with distribution and losses.—*H. W. Anderson*.

1780. TEMPLE, C. E. **The control of fruit diseases in 1922.** Rept. Maryland Agric. Soc. 7: 228-239. 1922 [1923]. The author discusses the abnormal weather conditions of the spring of 1922, to which the great losses to fruit growers from disease are largely accountable, and emphasizes the need of having trained agents in every county or fruit growing district to keep in touch with current conditions and give prompt advice to growers. Some data on the relative keeping qualities of sprayed, dusted and untreated peaches are also given.—*Lillian C. Cash*.

1781. WINGARD, S. A., AND JAMES GODKIN. **Tobacco diseases in Virginia and their control.** Virginia Polytech. Inst. Ext. Bull. 90. 1-31. Fig. 1-17. 1924.—This paper gives a popular discussion of blackfire (due to *Bacterium angulatum*), wildfire (*Bact. tabacum*), mosaic, root-rot (*Thielavia basicola*), black-shank (*Phytophthora nicotianae*), root-knot (*Heterodera radicicola*), wilt (*Bact. solanacearum*), frog-eye (*Cercospora nicotianae*), ring-spot, frenching, drought spot, and lightning injury.—*F. D. Fromme*.

1782. ZAPPE, M. P., AND E. M. STODDARD. **Results of dusting versus spraying in Connecticut apple and peach orchards in 1922.** Crop Protection Digest Bull. 14: 2-14. 1924.—Spray applications of lime sulphur, lead arsenate and nicotine gave better control of diseases and insect pests of apple than any of the dusts employed. Brown rot and scab of peach were controlled equally well by sulphur dust and "Atomic Sulphur" spray.—*F. D. Fromme*.

## PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*

E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 1052, 1149, 1207, 1500, 1999, 2033, 2088)

1783. ANONYMOUS. **Preserving power of sugar.** Australian Sugar Jour. 16: 264. 1924.—According to John McLean Thompson (West India Committee Circ.), "During a recent examination of the herbarium collections of Aublet which resulted from his famous expedition to the West Indies and Guiana, it was found that many of his plants collected during the years 1780-1784 had been preserved in what is apparently a sugar, and dried before mounting." Thompson found the preservation so perfect that he was able to employ portions of the plants for the most minute histological study, with results that compare favorably with those obtained from modern plants preserved in spirit or formalin. Thompson proposes carrying out an experiment with a view to obtaining light in this connection and, for his use in this experiment, the West India Committee has sent him every kind of sugar produced in the West Indies. Several cases are related to show the preservative qualities of sugar, particularly as relates to the teeth and viscera, and cases are also mentioned to show that sugar is a preventive of drunkenness.—*Nellie E. Fealy*.



1784. BRAECKE, MARIE. Sur la présence d'un glucoside dédoublable par l'émulsine dans les genres *Veronica*, *Euphrasia*, *Odontites*, *Bartsia* et *Pentstemon*. [Presence of a glucoside hydrolyzable by emulsin in the genera *Veronica*, *Euphrasia*, *Odontites*, *Bartsia* and *Pentstemon*.] Bull. Soc. Chim. Biol. 6: 665-671. 1924.—Aucubine has previously been reported by Bridel and Braecke (Bull. Soc. Chim. Biol. 4: 96. 1922; 5: 19-22. 1923; 5: 207. 1923) [See Bot. Absts. 13, Entries 2958, 2959] from various species of *Melampyrum*, and by Charaux (Bull. Soc. Chim. Biol. 4: 568. 1922) from *Veronica hederacfolia*. The investigation has now been extended to *Veronica Chaemedrys*, *V. persica*, *V. teucrium* var. *rupestris*, *V. arvensis*, *V. Beccabunga*, *V. anagallis*, *Euphrasia officinalis*, *Odontites*, *Bartsia viscosa*, and *Pentstemon Hartwigi*, employing Bourquelot's biochemical method. All of these forms contain a glucoside hydrolyzable by emulsin and apparently identical with aucubine.—Joseph S. Caldwell.

1785. BRIDEL, MARC. Sur la présence de monotropitine dans les racines fraîches de trois espèces de Spirées; *Spiraea Ulmaria* L., *S. Filipendula* L., *S. gigantea* var. *rosea*. [Presence of monotropitine in the fresh roots of three species of *Spiraea*.] Bull. Soc. Chim. Biol. 6: 679-682. 1924.—Following the methods employed in his work upon *Monotropa* and *Betula lenta*, the author has isolated and studied a glucoside yielding salicylic aldehyde from 3 species of *Spiraea*. It is identical with the monotropitine of *Monotropa*.—Joseph S. Caldwell.

1786. BRIDEL, MARC. Sur la véritable nature du glucoside à salicylate de méthyle existant dans l'écorce fraîche du *Betula lenta* L. [True nature of the methyl salicylate glucoside found in the fresh bark of *Betula lenta*.] Bull. Soc. Chim. Biol. 6: 659-664. 1924.—[See also Bot. Absts. 14, Entry 666.]

1787. CHARAUX, C. Sur la présence de la rutine dans certains végétaux. [Preparation et identification de ce glucoside et de ses produits de dédoublement. [The presence of rutin in certain plants. Preparation and identification of this glucoside and the products of its hydrolysis.] Bull. Soc. Chim. Biol. 6: 641-647. 1924.—The occurrence of rutin in 12 species in which it had not previously been found, is reported. Methods of extraction and purification are described. Hydrolysis by an aqueous extract of seed of *Rhamnus utilis* yields quercetin which was isolated and purified, and a mixture of rhamnose and glucose.—Joseph S. Caldwell.

1788. CHARAUX, C. Sur le dédoublement biochimique de la rutine-rutinine nouveau bi-ose, provenant de ce dédoublement. [Biochemical splitting of rutine-rutinose, a new sugar, arising from such splitting.] Bull. Soc. Chim. Biol. 6: 631-640. 1924.—The glucoside, rutine, is widely distributed and has been considered as yielding 1 molecule each of quercetin, rhamnose, and glucose on hydrolysis. On allowing an aqueous extract of the seed of *Rhamnus utilis* to act upon rutin for 10 days, a new sugar, which has been named rutinose, was isolated. On hydrolysis it yields rhamnose and glucose. An aqueous extract of *Rhamnus utilis* contains enzymes capable of hydrolyzing a number of glucosides, including not only those of *Rhamnus* spp. but also others from *Spiraea*, *Rubia*, *Robinia* and other species. A bibliography of 39 titles accompanies the paper.—Joseph S. Caldwell.

1789. CHOUX, PIERRE. Les plantes oléagineuses de l'Amazonie Brésilienne. [Oleagineous plants of the Brazilian Amazon.] Matières Grasses, Pétrole et Dérivés 15: 6450-6452. 1923.—Attention has been directed for several years to the resources of South America in oleaginous plants. The literature is briefly reviewed and the species yielding fats and oils are discussed.—Frederick V. Rand.

1790. EDENS, ERNST. Die Digitalis und ihre thereapeutische Anwendung. [Digitalis and its therapeutic uses.] Naturwissenschaften 11: 969-971. 1923.

1791. ENGLISH, E. F. A vegetable oil industry in South Africa. South African Jour. Indust. 7: 171-176. 1924.—There is a field in South Africa for the manufacture of edible and lubricating oils. The following vegetable oils are discussed with regard to source, uses, and composition: Castor oil, maize, cotton seed, peanut, linseed, soya bean, etc. These oily materials are likely to be of commercial importance in South Africa. Provided the soya bean is cultivated in a scientific manner there should be every possibility of expressing the oil in South Africa and shipping it to Europe; the oil-cake should find a good market in South Africa. The crop is valuable as a rotation with maize.—L. I. Goldblatt.

1792. FRYER, J. C. F., R. STENTON, F. TATTERSFIELD, AND W. A. ROACH. A quantitative

study of the insecticidal properties of *Derris elliptica* (Tuba Root). Ann. Appl. Biol. 10: 18-34. 3 fig. 1923.—The insecticidal value of the toxic extracts of the plants is high for caterpillars and low for aphids. The extracts "tuba toxin" and "derride" are solids only slightly soluble in water and their efficiency depends upon their degree of dispersion. A simple biological method of determining the insecticidal properties quantitatively is described.—*J. G. Leach*.

1793. GARDNER, ROY. The essential oil of *Manika* (*Leptospermum scoparium*). Jour. Soc. Chem. Indust. 43: 34T-35T. 1924.—The shrub known as "manka" is the dominant plant in the heathlands of New Zealand, covering thousands of acres. If the oil had sufficient value it could be produced commercially. Samples obtained from plants growing at sea level on basaltic soil were treated with super-heated steam at 120-150°C. and the oil was floated off. The average yield was 0.45%. This oil is pale greenish in color; it has  $n_D^{20} = 1.50$ ;  $d_4^{20} 0.921$  and the approximate boiling range is 160-270°C. The approximate composition of the oil is as follows: Phenols (leptospermol) 2.8%; terpenes, 2.8%; esters of cinnamic acid, calculated as ethyl cinnamate, 4.8%; other esters, calculated as  $\text{CH}_3\text{COOC}_{10}\text{H}_{19}$ , 12.9%; semi-solid, non-volatile matter, 7.7%; sesquiterpene (by difference), 69.0%.—*Henry R. Kraybill*.

1794. GUNN, J. W. C. South African medicinal plants. South African Jour. Indust. 7: 148-151. 1924.—South Africa, with its very abundant flora, probably has many plants of medicinal value, besides the few hundreds which are known to natives and others. The properties ascribed to many plants by the natives will have to be tested, as sometimes they are found to be absent. *Brachylaena elliptica* has been used extensively in the treatment of *diabetes mellitus* and competent observers speak highly of it. The cultivation of plants of known medicinal value might prove a source of profit, as also those yielding essential oil of commercial value. The author discusses the investigation of medicinal plants, and the difficulties involved.—*L. I. Goldblatt*.

1795. KARLIN, A. I. Ginseng. Australian Nat. 5: 182-183. 1924.—A short account of its oriental uses and of its cultivation in Korea is given.—*T. C. Frye*.

1796. KNAPP, A. W., AND R. V. WADSWORTH. The distribution of theobromine during the fermentation of cacao. Jour. Soc. Chem. Indust. 43: 124T-126T. 1924.—Theobromine, free and combined, occurs only in the cotyledons of the fresh cacao bean; it passes into the shell of the cacao during fermentation. The longer the fermentation the less theobromine will be found in cacao "nibs".—*Henry R. Kraybill*.

1797. MONDGILL, K. L. Travancore essential oils. I. Oil from the seeds of *Elettaria cardamomum* (Cardamoms). Jour. Soc. Chem. Indust. 43: 137T-138T. 1924.—Oil from wild cardamoms gives an abnormally high ester value. Malabar cardamon oil and Malabar and Mysore oils contain borneol, terpineol, cineol and sabinene (?) together with esters of acetic acid and another acid (mol. wt. 182?) having an order of cumic aldehyde. The constants of Malabar and Mysore oils, especially the refractive indices, change considerably during storage.—*Henry R. Kraybill*.

1798. OLARU, A. D. Formarea de produși otravitori în fânul proaspăt. [Development of poisonous products in fresh hay.] Viața Agr. [București] 13: 122-124. 1922.—The results of the investigations of Zchokke (Schweiz. Archiv. Tierheilkunde, p. 192, Zurich 1921) show that chemical decompositions take place in fresh hay which liberate poisonous products, through the activity of diastases set free in dying plants.—*Al. Borza*.

1799. PHILLIPS, L. W. The essential oils of some Western Australian plants. Jour. and Proc. Roy. Soc. Western Australia 9: 107-110. 1923.—The paper describes the physical properties and constituents of the essential oils of *Eucalyptus apathulata*, *E. campaspe* and *Agonis flexuosa*. The availability of these oils for commercial procedures is indicated.—*Wm. Randolph Taylor*.

1800. ROQUETTE-PINTO, E. Nota sobre a ação fisiologica da Fava Tonka. [Note on the physiological action of Tonka bean.] Bol. Mus. Nacion. Rio de Janeiro 1: 127-135. Fig. 1-5. 1924.—The seed of *Dipterix odorata* Willd, the Tonka bean, are used by the natives of Guiana and Brazil chiefly for their perfume. Injections of an extract of coumarin from these seed into frogs demonstrates that it has an anesthetic action in addition to the effect on heart action, previously recorded.—*Edith K. Cash*.



1831. SCHWARTZE, ERICH W., AND CARL L. ALSBERG. *Pharmacology of Gossypol*. Jour. Agric. Res. 23: 191-198. 2 pl. 1924.—These results, together with the chemical analyses previously reported, help to explain the regional distribution of cottonseed poisoning as due to regional variations in gossypol content of cottonseed. Besides showing a correlation between toxicity of crude cottonseed kernels and its estimated crude gossypol content, using rats as test animals, it seemed desirable to try to produce by experimental feeding of gossypol a physiological effect like the cottonseed intoxication of farm animals. Rats showed only loss of appetite, stunting, inanition, and death. Paralysis, often followed by recovery, was produced in cats and rabbits. Wasting of the limbs also sometimes occurred. Oedema of the lungs, hydropericardium, hydrothorax and hydroperitoneum were produced in cats. One case of hypertrophy of the heart was observed in a cat. Death may take place with much accompanying shortness of breath and weakness. Gossypol caused an increase of urinary N. It also changed a positive balance to a negative one, the animal continuing to eat all its food, though reluctantly. There is perhaps a loss of N by the feces which is not accounted for by diarrhea. In acute pharmacological experiments gossypol produces local edema when injected as the Na salt or if dissolved in oil and introduced into the ears, peritoneal cavity, subcutaneous tissue, etc. It produces serous and haemorrhagic edema of the lungs which is shown after death by a reddish discharge from the nose. Nearly all the symptoms observed in farm animals from the feeding of cottonseed meals have been reproduced by feeding gossypol to laboratory animals, thus warranting the conclusion that gossypol is the principal agent in cottonseed poisoning. The pharmacology of decomposition products of gossypol was not studied because the chemistry of such products has not yet been investigated.—*Frederick V. Rand*.

1802. SCHWARTZE, ERICH W., AND CARL L. ALSBERG. *Relation between toxicity of cottonseed and its gossypol content*. Jour. Agric. Res. 28: 173-189. 13 fig. 1924.—After an extensive analysis covering authentic samples of many varieties of cottonseed from different cotton growing territories of the U. S. A., 4 were selected for these experiments. Their crude gossypol content was as follows: Trice from Tennessee, 0.411%; Lone Star from Texas, 0.518%; Durango from the Atlantic Coast Region, 0.984%; and Egyptian from Arizona, 1.180%. The toxicity (acute and chronic) of these kernels to rats was estimated qualitatively and quantitatively and compared to the toxicity of an equivalent amount of pure gossypol. The crude gossypol was removed by ether extraction and the resulting oil solution was made up to volume with other fixed oil and injected into the peritoneal cavity. This was compared with a solution of gossypol in pure oil. Diets containing acutely fatal percentages of the kernels were prepared and compared with the acutely fatal percentage of gossypol. The toxic, but not lethal, and the apparently non-toxic percentages of cottonseed kernels fed were compared with their gossypol content. Comparisons were made largely on the basis of growth curves. Vitamines, salt content, proteins, etc., were controlled. With slight variations, the toxicity of the ether extracts and of the various diets agreed with their estimated crude gossypol content. The 2 varieties of seed containing the smallest quantities of gossypol were slightly less toxic than was estimated.—*Frederick V. Rand*.

1803. SOLIVEN, F. A. *The proximate composition of palomaria seed, oil, and resin*. Philippine Agric. 13: 65-79. 2 pl. 1924.—This article gives chemical analyses of palomaria seed, oil, and resin, from the nut of *Calophyllum inophyllum* L.—*Sam F. Trelease*.

1804. STOLL, A. *Über Mutterkorn*. [Ergot.] Naturwissenschaften 11: 697-705, 720-725. Fig. 1-5. 1923.—The author discusses the history and chemistry of ergot with a review of his own work on the isolation of ergotamin, the active principle of ergot. The paper includes a study with curves of the pharmacological effect of ergotamin.—*Orton L. Clark*.

1805. TATTERSFIELD, F., AND W. A. ROACH. *The chemical properties of Derris elliptica (Tuba Root)*. Ann. Appl. Biol. 10: 1-17. 1 fig, 1 diagr. 1923.—The toxic principles of the plant were isolated and some of their more simple properties examined. A chemical method of evaluating the root is outlined and an apparatus for extraction is described.—*J. G. Leach*.

## PHYSIOLOGY

B. M. DUGGAR, *Editor*W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 1037, 1039, 1074, 1098, 1101, 1104, 1109, 1118, 1171, 1186, 1187, 1204, 1216, 1226, 1227, 1275, 1296, 1309, 1445, 1511, 1542, 1545, 1547, 1550, 1551, 1552, 1583, 1605, 1632, 1633, 1788, 1801, 1805, 1984, 1987, 2029)

## GENERAL

1806. NICOLAS, G. *Revue des travaux de physiologie végétale parus de 1910-1919.* [Review of the work in plant physiology, 1910-1919.] *Rev. Gén. Bot.* 36: 220-240, 269-288, 325-336, 357-377. 1924.

## DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL RELATIONS

1807. BECQUEREL, PAUL. *La Bioradioactivité existe-t-elle?* [Does bioradioactivity exist?] *Compt. Rend. Acad. Sci. Paris* 178: 795-797. 1924.—Facts similar to those presented by Nodon (*Compt. Rend. Acad. Sci. Paris* 178: 486. 1924) were published by Tommasina (*Ibid.* 139: 730) in 1904. The latter found that plants and animals give concordant results,—exhibiting a high degree of "bioradioactivity." Numerous other observers have failed to get these results. Working with a method sensitive to less than 1/300 of the effect of uranium oxide, Becquerel obtained negative results, and so he asserts that such pronounced results as were found by Nodon and Tommasina could not have escaped his observation. It is not, therefore, thought that the contention of these authors is substantiated.—*C. H. Farr.*

1808. BEHRENS, CHARLES A. *Preparation and use of collodion sacs in exalting micro-organisms.* *Proc. Indiana Acad. Sci.* 1921: 69-73. 1922.—This is a general article describing a method for enhancing the virulence of pathogenic organisms. Hermetically sealed collodion sacs are employed and thus the culture is introduced into the living organism within a sealed permeable membrane whereby the pathogen is unaffected by the action of phagocytes, but is in contact with the body fluids. The present-day technique is described in comparison with earlier usage.—*B. M. Duggar.*

1809. BROOKS, MATILDA M. *Studies on permeability with reference to acids, alkalies, bicarbonates and arsenic.* *Carnegie Inst. Washington, Year Book* 22: 158. 1924.—The study employs the alga *Valonia*, and proceeds by means of sap analyses.—*B. E. Livingston.*

1810. DIXON, HENRY H. *Variations in the permeability of leaf cells.* *Sci. Proc. Roy. Dublin Soc.* 17: 349-356. 7 fig. 1924.—An apparatus is figured in which the electrical resistance of centimeter squares of leaf lamina may be measured. This amounts to 200,000 to 600,000 ohms at 0°C. in *Syringa vulgaris* and *Hedera helix*. The resistance decreases markedly when leaves are warmed from 0° to 50°; an almost identical curve is obtained using the same portion of leaf the next day. An increase in intercellular spaces leads to older leaves having a greater resistance, though thicker. Over the interval studied the ratio of conductivity at t° + 10° to that at t° varied from 1.70 to 0.92. The average of 30 observations gives 1.334, a figure almost identical with that obtained by Osterhout for *Laminaria*. The resistance of the living leaf was found to vary from 22 to 6 times that of the same leaf, killed by exposure to chloroform or carbon bisulphide. Rapid temperature changes were noted in insolated leaves, 1°-6° within a minute. Insolated tissue may be over 6° warmer than shaded portions of the same leaf even with intermittent sunshine. Temperature differences lead to differences in permeability; these acting in concert with the hydrostatic tension throughout the plant furnish a mechanism for the distribution of solutes.—*W. R. G. Atkins.*

1811. GOLDSMITH, G. W., AND J. H. C. SMITH. *Physical properties of the sap of Engelmann spruce.* *Carnegie Inst. Washington Year Book* 22: 306. 1924.—Sap content of young leaves varied with the season, being especially small for the "Krumholz" in early spring.—*B. E. Livingston.*



1812. JOEPES, E., AND E. G. HELLGREN. Über den osmotischen Druck einiger hochmolekularer Elektrolyte. [The osmotic pressure of some electrolytes of high molecular weight.] Biochem. Zeitschr. 145: 57-62. 1924.—The freezing point depression and the osmotic pressure of various salts of congo red were measured. In the Na salt, some of the Na ions were found to be osmotically active. The results indicate some relation between molecular volume and osmotic pressure.—H. D. Hooker, Jr.

1813. KLEBAHN, H. Neue Untersuchungen über die Gasvakuolen. [Recent investigations on gas vacuoles.] Jahrb. Wiss. Bot. 61: 535-589. 1922.—The author discusses the general nature of gas vacuoles and answers various objections to the theory of their existence. He first constructed a system of vacuoles by means of a hardened gelatin solution (gelatin foam) infiltrated with phenol. It was found that many of the characteristics of the natural gas vacuoles could be duplicated in this way. To determine the turgor pressure of cells of *Gloietrichia* he plasmolysed them with a sugar solution. Since the critical concentration of the sugar was about 8% it was calculated that the osmotic pressure within the cells was about 6 atmospheres. To determine the specific gravity of the cells of *Gloietrichia* they were first subjected to pressure to drive out the gas, then dried as well as possible on filter paper, and put in a pycnometer. A number of experiments showed a sp. gr. of 1.00853. By a series of calculations based on Archimedes' principle it was ascertained that the gas vacuoles must comprise at least 0.007% of the total volume of the cells. A large number of chemicals were used to determine the effects on the vacuoles. In general the following destroy the vacuoles: volatile hydrocarbons (pentane, octane, decane, hexylene, amylene, caprylene, benzol, toluol, xylol), the chlorine derivatives of some hydrocarbons (chloroform, carbon tetrachloride, di-tri-per-chlorethylene, pentachlorethane), amyl alcohol, amyl acetate, and cresol. Having a slight effect were: carbon disulphide, ether, propyl alcohol, monacetin, pyridine, and turpentine. Having no effect were: acetaldehyde, nitrobenzol, oil of citronella, castor oil, etc. The author explains the action of these substances on the basis of diffusibility of the gas, it being able to diffuse rapidly into some and not at all into others. By means of microtechnical fixing and embedding methods the author was able to demonstrate, in thin sections, gaps in the protoplasm corresponding to the vacuoles. Sometimes the gas (in *Gloietrichia* and *Anabaena*) may be forced out, by pressure on the cover glass, in the form of tiny bubbles near the cells. This is the case even though the algae are placed in strong KOH. A description is given of a specially constructed chamber, attached to the microscope, in which the pressure on the algae may be increased or decreased at will, and the effect observed. If a sudden pressure of 2-4 atmospheres is applied the vacuoles will disappear, but if the pressure is gradually applied they may not disappear even at 9 atmospheres. This is said to be due to the fact that the gas will be absorbed by the fluids present under great pressure and the vacuoles will be filled with water. A decrease of pressure, even to a high degree, has no effect at all. This is because the vacuoles are surrounded by a wall which will resist changes of at least 1 atmosphere. Further experiments, in which the pressure was obtained by centrifuging, gave the same results. Volume measurements showed that there was a decrease in the volume of the vacuoles under pressure, indicating the presence of a compressible gas. By means of complicated apparatus, some of the vacuole gas was obtained and subjected to several methods of micro gas analysis. No O<sub>2</sub> or combustible gas was found and no more CO<sub>2</sub> than might have been dissolved in the water or cell fluids. There was a great excess of N but technical difficulties prevented further analysis.—S. F. Cook.

1814. Красинский, Н. [KRASINSKI, N.] Действие электролитов на проницаемость плазмы. [Influence of electrolytes on the permeability of the plasma.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 19-20. 1921.—Quantitative determinations of the exosmosis of sugar from the cell in solutions of different electrolytes were made. Different salts, even at low concentrations, inhibit exosmosis. With rising concentration the influence of the salt increases to a certain limit, then decreases. The cause of the inhibition of exosmosis of sugars by the salts lies in the change of state of the colloids in the plasma (degree of hydration) which is combined with a change of their electrical charge.—V. Malchevski.

1815. SHAW, FREDERICK W. The Ostwald viscometer for the determination of the liquefaction of gelatin by bacteria. Jour. Bact. 9: 315-320. 1924.

1816. URSPRUNG, A., UND G. BLUM. Eine Methode zur Messung des Wand- und Turgordruckes der Zelle, nebst Anwendungen. [A method for measuring the turgescence and wall pressure of the cell, with applications.] Jahrb. Wiss. Bot. 63: 1-110. 1924.—The author bases his method on a mathematical consideration of the pressures on the cell. The fundamental fact is that the increase in pressure of the wall is about proportional to the increase in volume of the cell as long as the limit of elasticity is not passed, the modulus of elasticity remains constant, and the ratio of the radius of the lumen to the thickness of the wall is not too small. If  $W$  is the wall pressure,  $V$  the volume of the cell,  $O$  the osmotic value,  $S$  the absorptive power of the contents,  $n$  the normal condition,  $g$  the limiting plasmolysis, and  $s$  the saturation point, then  $\frac{Wn - Wg}{Ws - Wg} = \frac{Vn - Vg}{Vs - Vg}$ , for  $Wg$  is equal to zero; also  $Wn = \frac{Vn - Vg}{Vs - Vg} \cdot Ws$ . If the term  $Os$ , or osmotic pressure at the saturation point is known, by a series of substitutions  $Ws$  can be found, it being of course necessary to determine experimentally the volume under the various conditions. For example, in the case of certain cells of *Impatiens* the term  $Os$  is equivalent to 0.34 M cane sugar. By substituting and solving,  $Wn$ , or the normal wall pressure, was found to be 5.4 atmospheres (atm.). The greatest technical difficulties lie in the measurements of cell volumes. Since, however, only the volume ratios are used, precise determinations are not necessary so long as the error is proportional in all the measurements. Various methods are used in these determinations. As to the relation between turgescence and wall pressure these values must be equal and opposite in the individual cells; but they may be unequal in an aggregate of cells or in a tissue. In the stomata of *Convallaria majalis* it was found that the lowest osmotic pressures in the guard cells were in wild growing plants and the highest in plants kept in a moist sunny room. Also, with numerous exceptions, the stomata opened with increase in turgor. The relation of growth to osmotic values was studied in root-tip cells of *Vicia faba*, *Tradescantia*, and *Robinia pseudacacia*. The greatest absorptive power was found in the cells in the zone of greatest growth and the least in the zone of the root hairs. In the latter the turgescence was greatest. In the growth of the root 2 processes are present; the increase in the volume of the cells and the change in area of the walls. For an increase in volume the cells must take in water; the maximum absorptive power of the growth zone is therefore evident, while a great wall pressure would only be a hindrance. In roots of *Vicia faba* which are bending geotropically the osmotic values on both sides of the bend are about equal, but the greatest absorptive power is on the convex side and the least on the concave side; turgescence is the reverse. Similarly, in bending *Tradescantia* branches the osmotic pressures are equal while the absorptive power and turgescence differ markedly, depending on the concavity and convexity of the bend. In the cambium of *Robinia* branches, there are high osmotic pressures (45 atm.) in March which fall to about 18 atm. in June. The absorptive power remains practically constant while the wall pressure varies greatly. There is a detailed discussion of all these cases—and also other examples are given—especially in relation to energy considerations and the mechanical and physical requirements of the plant during growth.—S. F. Cook.

1817. Вальтер, О. [WALTER, O.] К методике изучения проницаемости протоплазмы. [Method of studying the permeability of protoplasm.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 70-71. 1921.—A description is given of the method of studying permeability by means of the optical lever. "This method has significant advantages (use of solutions that do not involve plasmolysis, practically instantaneous change of the acting factors, reduction of the duration of the experiments to 1 minute, etc.)." A series of experiments is described, which illustrates the method and proves the sensitiveness of the object to changes of concentrations of the order of 1/10,000 N. Examples are given of direct determinations of the suctional power of the cells under natural conditions.—V. Malchevski.

1818. Вальтер, О., и Е. Ловчиновская. [WALTER, O., AND E. LOVCHINOVSKAIA.] К изучению проницаемости плазмы к воде. [Studies on the permeability of the protoplasm to water.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 71-72. 1921.—Experiments are reported showing the influence of H-ions on the intake and excretion of  $H_2O$  by the cell. Permeability to  $H_2O$  rises with increase of acidity. Increase in H-ions contributes to the growth of the object even after a transitory contact (30"-1') with the acid medium.—V. Malchevski.



1819. Вальтер, О., и М. Островская. [WALTER, O., AND M. OSTROVSKAIA.] **К Изучению проницаемости плазмы для солей.** [Studies on the permeability of protoplasm to salts.] *Дневник Русского Ботанического Конгресса.* [Jour. Russian Bot. Congress] 1: 72. 1921.—The investigation is not yet finished. Experiments are reported concerning (1) the repeated action of salt solutions of the same concentration; (2) the influence of change of concentration on plasmolysis and recovery; (3) the state of equilibrium in  $H_2O$  and in salt solutions.—V. Malchevski.

1820. WASTL, H. **Über die Oberflächenspannung von Saponinlösungen.** [The surface tension of saponin solutions.] *Biochem. Zeitschr.* 146: 376-379. 1924.—The surface tension of saponin solutions is altered by the presence of other substances such as acid, alkali or another saponin.—H. D. Hooker, Jr.

1821. Заленский, В., и Е. Шэффер. [ZALENSKI, V., AND E. SCHAEFFER.] **Влияние анестезирующих веществ на осмотическое давление клеточного сока.** [Influence of anesthetics on the osmotic pressure of cell sap.] *Дневник Русского Ботанического Конгресса* [Jour. Russian Bot. Congress] 1: 65. 1921.—Experiments made with potato tubers, onions (*Allium cepa*), etc., showed that the osmotic pressure of the cell sap rises under the influence of ether and chloroform vapors. Determinations were made by the cryoscopic method. The increase of osmotic pressure may be explained by vigorous processes of hydrolysis, while the processes of synthesis are checked by the influence of the anesthetics.—V. Malchevski.

### WATER RELATIONS, TRANSLOCATION

1822. AUCHTER, E. C. **Is there normally a cross transfer of foods, water and mineral nutrients in woody plants?** *Maryland Agric. Exp. Sta. Bull.* 257. 33-60. 1923.—Does a woody plant act as a unit in regard to intake and utilization of mineral nutrients and water and to the synthesis, translocation, and storage of foods, or do individual parts or sections of the plant function independently in these respects? Four-year-old peach and apple trees growing under uniform orchard conditions at Ithaca, N. Y., 3-year-old privet grown in pots, privet cuttings in pots and 5-year-old oaks growing in sod were given differential treatments with regard to  $NO_3$  supply, pruning, and defoliation, applied to opposite sides of the experimental plants. The effect of these treatments was studied through determinations of the moisture percentage, total N, total ash, freezing point of sap, catalase activity, transpiration, and temperature of leaves on opposite sides of the plants at appropriate intervals after treatment. The results indicate that the mineral nutrients and N absorbed by the roots on one side of a woody plant are translocated to and used by the portions of the tree directly above, and that there is very little cross-transfer of such nutrients within the plant. Likewise, elaborated food-materials produced in one side of a plant are used or stored mainly on that side. There was very little crossing over or equalizing of foods or nutrients later in the season, even long after growth had ceased. The results concerning cross-transfer of water in the plant are said to be not fully conclusive, though it appears that  $H_2O$  may move through or around the plant without much difficulty, thus affording further evidence of the independent movement of  $H_2O$ , nutrients, and elaborated foods within the plant.—Concerning the practical applications of these studies it is pointed out that halves of trees may be used as checks against other halves in controlled experiments; in tree injection experiments or treatments it will be necessary to make several injections at regular intervals around the trunk; it may be possible, by cultivation, pruning, or fertilization of biennial fruiting trees to make opposite sides bear in alternate years.—J. T. Rosa.

1823. BOSE, J. **L'ascension de la sève et la pulsation chez les arbres.** [The ascension of sap and pulsation in trees.] *Rev. Gén. Bot.* 36: 378-384. 1924.—This résumé of a lecture by Bose is in reality a review of his book "The physiology of the ascent of sap."—J. C. Gilman.

1824. ILJIN, W. S. **Über den Abbau der Stärke durch Salze.** [The hydrolysis of starch by salts.] *Biochem. Zeitschr.* 145: 14-17. 1924.—Chlorides of Na, Li, Ca, K, Mg and Ba in dilute concentrations hydrolyzed dilute starch paste. The I reaction disappeared most rapidly in 0.02% starch paste with m/1000 to m/20 NaCl solution or with m/2000 to m/1000  $CaCl_2$  solution. Higher concentrations retarded hydrolysis.—H. D. Hooker, Jr.

1825. MCGINNIS, HELEN A., AND W. B. MCDUGALL. A comparison of the transpiration rates of corn and certain common weeds. Illinois Acad. Sci. Trans. 16: 82-87. 1923.—The author's summary is as follows: "(1) The relative rate of transpiration of *Zea Mays*, as indicated by cobalt paper, is lower per unit area than that of *Polygonum pennsylvanicum*, *Sida spinosa*, *Ambrosia artemisiifolia*, *Abutilon Theophrasti* and *Setaria glauca*. (2) Of the weeds compared with *Zea Mays*, *Ambrosia artemisiifolia* has the highest rate of water loss. (3) The transpiration rates of *Zea Mays* and *Setaria glauca* are more nearly similar than those of the corn and any of the dicotyledonous plants studied." A bibliography of 19 references is appended.—H. W. Anderson.

1826. МАКСИМОВ, Н. и Л. ФРЕЙ. [MAXIMOV, N., AND L. FREI.] Влияние влажности почвы на транспирационную способность растений. [Influence of soil moisture on the transpiration capacities of plants.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 88-89. 1921.—Using zinc pots, experiments were made with plants of different types, and with varying soil moisture. When the soil moisture equaled 60% of the water holding capacity of the soil, the plants developed a leaf area 5-6 times greater than with 40%. Neither in the structure of the leaves nor in the intensity of transpiration could one observe any peculiar differences.—V. Malchevski.

1827. МАКСИМОВ, Н., и В. РЫБИН. [MAXIMOV, N., AND V. RYBIN.] К вопросу о вне-стичной регуляции транспирации. [Non-stomatal regulation of transpiration.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 25-26. 1921.—Experiments made with branches of magnolia and cherry laurel with closed stomata showed that smearing of the absorbing surface reduces transpiration to 50%; renewal of the cut again increases it. A branch of cherry laurel at constant temperature in the dark, with closed stomata (porometric experiments) increases transpiration for the 1st 2 days, then diminishes it. According to the authors, the transpiration may be regulated by the condition of absorption as well as by the action of the stomata.—V. Malchevski.

1828. WYLIE, R. B. Concerning the capacity of foliage leaves to withstand wounding. Proc. Iowa Acad. Sci. 28: 293-304. 1921 [1923].—With razor or punch, cuts of many kinds were made in leaves of lilac, *Tilia americana*, *Quercus macrocarpa*, *Symphoricarpos occidentalis*, etc., in regions of small veins, major veins and midribs. "The ordinary foliage leaf is so organized as to withstand serious wounds as well as losses of considerable amounts of tissue. . . . Injuries to the blade between larger veins are always local in effect. . . . Leaves may get along very well without midrib if there is considerable width of blade on either side to provide for conduction and mechanical support. . . . Broader leaves succeed very well without their principal veins, or even with major veins and midrib destroyed."—H. S. Conard.

1829. WYLIE, R. B. Plants and the surface film of water. Proc. Iowa Acad. Sci. 30: 337-343. 1923 [1924].—Roots get  $H_2O$  from the capillary surface films in the soil; these films are supplied by capillarity from lower layers of soil; soil texture is important here. Surface films prevent entrance of liquid  $H_2O$  into stomata and intercellular spaces. Buoyancy is attained by aquatic plants by means of air bubbles or unwetted trichomes (*Salvinia*), both of which are due to the surface film. Pollen grains and seed are often supported for distribution by the film (support). Anchorage is afforded for swarm spores and germinating algae. Equilibrium is maintained by the film for *Ricciocarpus*, *Lemna*, *Azolla*, etc. Respiration is facilitated in stranded mats of algae. Reproduction is aided by the surface film in the pollination of *Myriophyllum*, species of *Potamogeton*, *Elodea*, and *Vallisneria*.—H. S. Conard.

1830. WYLIE, R. B. Submarginal venation of foliage leaves. Proc. Iowa Acad. Sci. 29: 233-237. 1922 [1924].—By means of longitudinal cuts with a razor in leaves of lilac and *Asclepias syriaca*, the efficiency of marginal vein systems is tested. "It would appear that in the outer part of the leaf a plexus of connecting veins offers advantage over a definite, single submarginal vein."—H. S. Conard.

1831. Заленский, В. [ZALENSKI, V.] О действии высоких температур на состояние устьичного аппарата у растений. [Action of high temperature on the behavior of stomata.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 62-63. 1921.—When the temperature rises to 35-50°C., starch in the guard cells is transformed to maltose



and the turgor of these cells rises, in consequence of which the stomata open widely, a fact which may be also observed in wilting leaves. The rapidity of starch hydrolysis varies in different plants (oats, 4-5 hours; wheat, 15-20 hours; while in millet it has not been observed even after 48 hours). Hydrolysis continues in both light and darkness. A reverse transformation of maltose into starch has not been noted. At high temperatures the plasma passes to a dormant state; the processes of synthesis are inhibited and those of hydrolysis are accelerated. Out of more than 50 species investigated, only in millet and succulents has opening of the stomata at high temperatures not been observed.—V. Malchevski.

1832. ЗАЛЕНСКИЙ, В. [ZALENSKI, V.] О Физиологическом воздействии мглы на растения. [Physiological action of "dry fog" on vegetation.] Дневник Русского Ботанического Конгресса. [Jour. Russian Bot. Congress] 1: 63. 1921.—Small particles suspended in the air ("mgla" or "dry fog") raise the temperature, absorb light and decrease air humidity, condensing H<sub>2</sub>O vapor on their surfaces. According to many hundreds of observations the stomata open widely at high temperatures during several days and do not close even when the leaves wilt; the plant loses its power of regulating transpiration. Only a few selected lines of millet could withstand high temperature. The author hopes, therefore, that it will be possible to select drought-resistant lines of other plants.—V. Malchevski.

### MINERAL NUTRIENTS AND SALT RELATIONS

1833. BESSENICH, FRIEDA. Untersuchungen über die Endospermentleerung von Zea Mais. [Depletion of the endosperm in Zea Mais.] Jahrb. Wiss. Bot. 63: 231-272. 1924.—The author used a modification of Hansteen and Puriewitsch's plaster of Paris method to study the depletion and the rapidity with which the substances are drawn off. It was found that the addition of other substances to the H<sub>2</sub>O in which the endosperm was kept exerted considerable influence. Calcium sulphate inhibits the depletion as does also the H-ion of various acids. However, every acid may have a specific action, caused by the anion or undissociated molecule. Thus HCl was much stronger in its retarding action than H<sub>3</sub>PO<sub>4</sub> at the same pH. Using buffer solutions a retardation was likewise discovered which could not be due solely to the action of the H-ion. The optimum pH seemed to be about 5. Hydroxyl ions exerted an inhibitory influence.—S. F. Cook.

1834. BOKORNY, T. Wasserkulturen mit Benzoesäurezusatz. Assimilierung der Benzoesäure durch Kulturpflanzen. [The assimilation of benzoic acid in water cultures.] Biochem. Zeitschr. 145: 306-308. 1924.—Oat seedlings in water culture grew more when benzoic acid was present in dilute solution. Individual plants absorbed 0.09 gm. benzoic acid. As no benzoic acid was found in the plants, it is assumed that the benzoic acid absorbed was assimilated.—H. D. Hooker, Jr.

1835. DAHM, PAUL. Untersuchungen über die Abhängigkeit der Endospermentleerung bei Zea Mais von verschiedenen Salzen. [The dependence on various salts of the endosperm depletion of Zea Mais.] Jahrb. Wiss. Bot. 63: 273-320. 1924.—The author worked on the effect of the alkali and alkali-earth salts, using the method of Bessenich (see Entry 1833). The quantity of sugar withdrawn from the kernels of the same ear under the same conditions was very variable. Greater differences were found in kernels of different ears of the same race. The withdrawal of sugar frequently amounted to as high as 80% of the quantity which could be theoretically obtained from the corn starch present. Comparable results can be obtained only by keeping temperature and experimental time constant. Solutions of chlorides of the alkali and alkaline earth elements in certain concentrations retard endosperm depletion. Their relative activity is shown in the following series: Na, NH<sub>4</sub>, Mg, Ca, Sr < K < Ba < Li. The relative activity of the salts of Na investigated is shown in the following series: sulphate, nitrate, chloride, primary phosphate < rhodanate, tartrate < bromide < borate < carbonate, secondary phosphate, acetate. Buffer solutions can be used in low concentrations. A slight stimulation of activity was shown at pH 6. The inner endosperm of corn in the dry state contains no active diastase. The aleurone layer is necessary for starch hydrolysis, and the scutellum plays no part.—S. F. Cook.

1836. DESEÖ, D. VON. Beitrag zur Kolorimetrischen Eisenbestimmung. [Colorimetric

estimation of iron.] *Biochem. Zeitschr.* 146: 323-327. 1924.—Concentration of acid and the presence of phosphate affected the colorimetric estimation of Fe proposed by Autenrieth and Funk. Previous heating with HCl was found advisable when phosphates were present.—*H. D. Hooker, Jr.*

1837. ДОМОНТОРИЧ, М. [DOMONTORICH, M.] Физиологический антагонизм кислот и нейтральных солей. [Physiological antagonism of acids and neutral salts.] *Дневник Русского Ботанического Конгресса* [Jour. Russian Bot. Congress] 1: 37-38. 1921.—Comparison was made of the toxicity of solutions of HCl and HNO<sub>3</sub> with the toxic action of the same acids in salt solutions on the leaves of *Elodea* and on pieces of red beet root. The degree of toxicity was measured by the quantity of non-plasmolyzed cells. Chlorides and sulphates of Ca, Sr, Mg, and Na promote the stability of the cells to withstand the toxic action of acids. Anions of strong acids when sufficiently diluted do not influence the protective power of the salts; cations may be placed in the following order according to their protective activity: NH<sub>4</sub> < Na < K < Mg < Ba < Sr < Ca. Other experiments with beet root gave the following range of rising protective activity: NH<sub>4</sub> < Na, K < Mg, Mn < Na, Sr < Ca < Al. Comparisons were made of the action of acids and mixtures of acids and salts on the growth of wheat roots. Salts of CaSO<sub>4</sub>, CaCl<sub>2</sub>, and Sr(NO<sub>3</sub>)<sub>2</sub> restrained the toxicity of HNO<sub>3</sub>.—*V. Malchevski.*

1838. HERRMANN. [Rev. of: IWANOFF, LEONID. Über die Transpiration der Holzgewächse im Winter. II. (Transpiration of trees in winter.) *Ber. Deutsch. Bot. Ges.* 17: 210-218. 1924.] *Deutsch. Forstzeitg.* 39: 840. 1924.

1839. КОРСАКОВА, М. [KORSAKOVA, M.] Кислотность сфагновых мхов и их отношение к углекислому кальцию. [The acidity of Sphagnum and its relation to calcium carbonate.] *Дневник Русского Ботанического Конгресса* [Jour. Russian Bot. Congress] 1: 89. 1921.—Sphagnum absorbs Ca from solutions of CaCO<sub>3</sub>. Absorption is more rapid, the higher the concentration of the solution or the greater the quantity of CaCO<sub>3</sub> per unit of fresh weight of the moss in solutions of the same concentration. Under the influence of CaCO<sub>3</sub> on the Sphagnum the alkalinity of the solution diminishes and the acidity of the moss also becomes lower. When CaCl<sub>2</sub> solution acts on the Sphagnum, Ca is absorbed in smaller proportions than from isosmotic solutions of CaCO<sub>3</sub>. Calcium carbonate is more vigorously absorbed by species of mosses which possess a higher acidity.—*V. Malchevski.*

1840. KUGELMASS, I. NEWTON, AND A. T. SHOHL. Equilibres comportant des ions calcium, hydrogène, carbonate, bicarbonate, phosphate primaire, phosphate secondaire, phosphate tertiaire. [The equilibrium which exists between the ions of calcium, hydrogen, carbonate, bicarbonate, and the primary, secondary, and tertiary phosphates.] *Compt. Rend. Soc. Biol.* 91: 130-131. 1924.

1841. KUHN, RICHARD. Zur Mikrobestimmung der Phosphorsäure. [Micro-chemical determination of phosphoric acid.] *Zeitschr. Physiol. Chem.* 129: 64-79. 1923.

1842. LUNDEGÅRDH, H. Der Einfluss der Wasserstoffionenkonzentration in Gegenwart von Salzen auf das Wachstum von *Gibberella Saubinetii*. [Influence of hydrogen ion concentration in the presence of salts on the growth of *Gibberella Saubinetii*.] *Biochem. Zeitschr.* 146: 564-572. 2 fig. 1924.—In strongly acid solutions, *Gibberella Saubinetii* grew better when Ca was present. Calcium showed no nutritive effect and was antagonistic to Mg. Antagonism to H-ions was evident when the fungus was grown on earth as well as in peptone cultures. Ammonium ions had a similar but much less marked action.—*H. D. Hooker, Jr.*

1843. REED, H. S., AND A. R. C. HAAS. Some relations between the growth and composition of young orange trees and the concentration of the nutrient solution employed. *Jour. Agric. Res.* 28: 277-284. 1 pl. 1924.—Seedlings of African sour orange (*Citrus aurantium*) were grown in culture solutions ranging in concentration from 360 to 3600 parts per million of nutrient salts. Those grown in solutions having an initial concentration of 2200 parts per million made the best growth. The ash content of stems and leaves was relatively greater in seedlings grown at the higher concentrations. The sap expressed from the leaves of young Valencia orange (*Citrus sinensis*) trees was remarkably constant in osmotic concentration as determined by the freezing point depression, and in H-ion concentration, although the trees were grown in sand cultures which received nutrient solutions of differing concentration. The trees in sand cultures were less influenced by the concentration of their nutrient solution than



those in water culture, and the composition of the ash was relatively more constant. Extensive studies were made of the portion of the inorganic constituents of the dry plant material which are soluble in  $H_2O$ . The highest percentage of soluble materials was found in the dry matter of the leaves, while the lowest percentage was usually found in the trunk and root. Trees grown in more concentrated solutions had relatively more  $H_2O$ -soluble inorganic material in the dry matter. There seems to be no evidence in support of the assumption that the absorbed materials are converted into insoluble compounds as rapidly as they accumulate in the tree, nor that absorption necessarily depends on the precipitation of ions within the tree.—*H. S. Reed.*

### PHOTOSYNTHESIS

1844. ЛЮБИМИНКО, В. Н., и А. М. Пегелина. [LUBIMENKO, V. N., AND A. M. PETELINA.] Еще к вопросу о функциональной энергии листа в фотосинтезе. [New researches upon the functional energy of the leaf in photosynthesis.] (French resume.) Известия глвного ботанического сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. Republique Russe] 21: 73-87. 1922.—As a result of investigations upon *Lupinus luteus* grown in the open, the authors conclude that: (1) Diminution of total leaf surface induces a plant to develop new leaves very rapidly in order to restore the leaf surface curtailed by the operation. (2) This reaction varies in direct ratio with amount of injury. (3) Because of this reaction the distribution of nutrient substances to roots, stems and leaves of treated plants remains the same as in the normal. (4) The production of nutrient substances per unit of leaf surface is greater in treated than in normal plants. (5) The energy of photosynthesis increases with the amount of injury to the plant. (6) The normal plant does not utilize all the functional energy of its leaves and their synthetic activity is regulated by internal factors. (7) It is very probable that this limitation is due to the rapidity of transport and utilization of organic products accumulated in the leaf tissue. If transport and consumption are slow the products of photosynthesis remain in the green tissue and thus by their own accumulation hinder the synthetic activity of the leaf. Wounding increases the energy of respiration and of the utilization of carbohydrates, which in turn increase the energy of photosynthesis.—*Frederick V. Rand.*

1845. WARBURG, O., AND T. UYESUGI. Über die Blackmansche Reaktion. [Blackman's reaction.] Biochem. Zeitschr. 146: 486-492. 1924.—The liberation of  $O_2$  from  $H_2O_2$  by *Chlorella* was retarded by hydrogen cyanide. This supports Willstätter's theory that the Blackman reaction consists of the liberation of  $O_2$  from a peroxide produced by the photosynthetic reduction of  $CO_2$ .—*H. D. Hooker, Jr.*

### METABOLISM (GENERAL)

1846. BERTHELOT, ALBERT, ET E. OSSART. Sur la teneur en glucides des bacilles tuberculeux et paratuberculeux. [The carbohydrate content of tubercle and paratubercle bacilli.] Bull. Soc. Chim. Biol. 6: 677-678. 1924.—Human, bovine and avian strains of *B. tuberculosis* were grown on glycerin-peptone bouillon under identical conditions, extracted with  $H_2O$ , alcohol and ether, hydrolyzed at  $134^\circ$  for 1 hour with 20%  $H_2SO_4$ , and the reducing sugars determined. Bacilli of the human type contained 5.87% reducing sugar; those of the bovine type, 6.80%; those of the avian type, 1.69%. "Bacilli de la fleole" contained 0.75%. There is thus a marked difference between the avirulent avian and paratubercular types and the virulent types, the former being much lower in hydrolyzable polysaccharides.—*Joseph S. Caldwell.*

1847. BORESCH, K. [Rev. of: DANILOV, A. N. La phycocyanine et la phycoerythrine d'après les données de l'analyse spectrale. (Spectral analysis of phycocyanin and phycoerythrin.) Bull. Jard. Bot. Pierre Le Grand 16: 357. 1916.] Arch. Protistenk. 46: 392. 1923.

1848. BRAUN, H., A. STAMATELAKIS UND SEIGO KONDO. Der Verwendungsstoffwechsel Säurefester Bakterien. I. [The assimilation of acid-fast bacteria.] Biochem. Zeitschr. 145: 381-397. 1924.—Timothy bacillus of Möller was able to grow with acetic, oxalic, lactic, succinic, malic, tartaric, or citric acid, ethyl alcohol, glycerol, mannitol, glucose, or fructose as a source of carbon but not with formic acid, methyl and amyl alcohol, lactose, maltose, or sucrose. As a source of N the bacillus used  $NH_3$ ,  $NO_3$ , glycine, alanine, leucine, aspartic acid,

asparagin, glutamic acid, and tyrosine. Lactic acid and alanine gave the best growth. Sulphur, phosphorus, magnesium, and either sodium or potassium are the essential mineral elements. Other acid-fast saprophytic bacilli showed similar nutritive requirements, particularly in using ethyl alcohol as the sole source of carbon.—*H. D. Hooker, Jr.*

1849. BRAUN, H., A. STAMATELAKIS, SEIGO KONDO, UND R. GOLDSCHMIDT. Der Verwendungsstoffwechsel säurefester Bakterien. II. [The assimilation of acid-fast bacteria.] *Biochem. Zeitschr.* 146: 573-581. 1924.—Tuberculosis bacteria of turtles and glow-worms were able to use as a source of C acetic, propionic, butyric, succinic, malic, and citric acid, glycerol and glucose, but not formic, oxalic or tartaric acid, methyl, ethyl or amyl alcohol, mannitol, lactose, maltose, or sucrose. As a source of N they grew with  $\text{NH}_3$ , nitrates, alanine, glutamic acid, glycine, aspartic acid, leucine, and tyrosine. Magnesium sulphate greatly increased the growth and K was unnecessary.—*H. D. Hooker, Jr.*

1850. BRIGL, PERCY, AND EDGAR FUCHS. Über die Lignocerinsäure und ihre Derivate. [Lignoceric acid and its derivatives.] *Zeitschr. Physiol. Chem.* 119: 280-311. 1 fig. 1922.—The constitution of beech tar and its waxes is considered. There are 2 isomeric lignoceric acids present in the tar, 1 of which, tetracosanic acid ( $\text{C}_{24}\text{H}_{48}\text{O}_2$ ) has a melting point of  $85^\circ\text{C}$ . A peculiar type of isomerism is suggested, based upon the conception of a spiral carbon chain, which may give rise to 2 isomers by clockwise and counterclockwise arrangement of the spiral carbon chains.—*Chas. A. Shull.*

1851. BROADHURST, JEAN. Heating to facilitate measurement of precipitates. *Jour. Bact.* 9: 511-512. 1924.—The author gives a method for breaking up precipitates of yeast growths for vitamin efficiency tests so that measurements can be made by turbidity determinations.—*C. E. Skinner.*

1852. BRUNSWIK, HERMANN. Die Grenzen der mikrochemischen Methodik in der Biologie. [The limitations of microchemical methods in biology.] *Naturwissenschaften* 11: 881-885. 1923.—After a discussion of the specific nature and sensitivity of the usual microchemical tests, the writer concludes that: As valuable and necessary as the microchemical methods are for the different branches of natural science, they are still of little help in biological or cellular microchemistry, because of their limited sensitivity and lack of subtle localization, in solving problems of metabolism or questions of changes of form.—*Orton L. Clark.*

1853. BUTKEWITSCH, W. Über die Umwandlung der Chinasäure durch die Pilze. [The transformation of quinic acid by fungi.] *Biochem. Zeitschr.* 145: 442-460. 1924.—Various *Aspergillaceae* transformed quinic acid to protocatechuic acid and pyrocatechol and perhaps also to hydroquinone and quinone. Colored condensation products of these phenols were sometimes formed. In older cultures on quinic acid salts, the phenols were oxidized to oxalic acid. In cultures on the free acid no oxalic acid was formed. All fungi that grow on quinic acid form citric acid from sugar. Fungi, such as *Mucor racemosus*, which do not transform quinic acid to phenols, do not produce citric acid. It is suggested that in the higher plants phenols are formed from inositol and similar compounds derived from hexoses.—*H. D. Hooker, Jr.*

1854. CAMPBELL, RAY, AND WALTER NORMAN HAWORTH. Synthesis of amygdalin. *Jour. Chem. Soc. [London]* 125: 1337-1343. 1924.

1855. CLOT, G. Analyse de pois de cap de Madagascar. [Analysis of "Cape pea" of Madagascar.] *Ann. Mus. Colonial Marseille* 1919: 97-99. 1919.—The phaseolunatin content of the "Cape pea," (*Phaseolus lunatis*) grown in the province of Tuléar, Madagascar, was determined. The glucoside was hydrolyzed by the Grignard method and the hydrocyanic acid formed was titrated against 0.02 N silver nitrate. The HCN found, 0.0064 gm. per 100 gm. of the beans, is about the normal amount. The author considers this too little to cause any ill effect if the beans be eaten either cooked or raw.—*V. K. Chesnut.*

1856. CLOT, G. Note sur la composition chimique de deux graines de Palmiers de Madagascar. [Chemical composition of two palm seeds from Madagascar.] *Ann. Mus. Colonial Marseille* 3 ser. 72: 100-105. 1919.—The horny seed of 2 palms, the satranamira (*Hyphaene Shatan*) and the dimaka (*Borassus madagascariensis*), both from western Madagascar, were analyzed in respect to moisture, fat, nitrogenous matter, water-soluble ash, water-insoluble



ash, and cellulose content. There were some significant differences, especially in fat content.—Hyphaene oil is at first a pale yellow liquid, solidifying in part, at 20°C., to a buttery consistency. Its odor is like that of palm oil and it has an iodine number of 21.9 and a saponification number of 245.3. The fat-free powder is hydrolyzed best by heating 2 hours with 2 N H<sub>2</sub>SO<sub>4</sub> in an autoclave at 110–120°. Analysis of the products thus obtained showed that both seed contained mannose and glucose but no levulose nor galactose, the ratio of mannose to glucose being considerably greater in *Borassus* than in *Hyphaene* seed.—*V. K. Chesnut*.

1857. COLIN, H., ET A. CHAUDUN. *Le glucose du sucre de canne*. [The glucose of cane sugar.] Bull. Soc. Chim. Biol. 6: 625–630. 1924.—Recent studies of stereo-isomerism indicate that glucose with a dextrorotation of +52.5° is a mixture in equilibrium of 2 forms, A and B, having rotations of +110 and +19. When a glucoside or polysaccharide is hydrolyzed, setting free one of these, transformation into the other form proceeds until equilibrium is attained, when the rotation is +52.5°. Evidence that the dextrose formed during hydrolysis of cane sugar is the A-form and that it is partially converted into the B-form has been obtained by following the progress of hydrolysis with a Jobin and Yvon polarimeter equipped with a Lippich prism and a mercury vapor lamp. Determinations of the invert sugar present at 15-minute intervals throughout the progress of hydrolysis show a large excess over the amounts indicated by the polarimeter readings in the early stages of hydrolysis. This is evidence that the A-form of dextrose is set free by hydrolysis and progressively converted into the B-form.—*Joseph S. Caldwell*.

1858. ДАНИЛОВ, А. Н. [DANILOV, A. N.] *Гидрохромы синезеленых и багряных водорослей*. [Hydrochrome of the blue-green and red algae.] (German resume.) Известия главного ботанического сада Р. С. ф. С. Р. [Bull. Princip. Jard. Bot. Republique Russe] 21: 114–143. 1922.—The author investigated the water-soluble pigments of blue-green algae grown in pure culture and also of red algae which he had collected in the Arctic Ocean. As a result of these studies he associates the ground hydrochrome of the Cyanophyceae with the phycocyan group, and that of the Florideae, with the phycoerythrin group, and classifies these pigments as follows: (1) Blue-green, or phycocyan *a*; (2) violet-blue, or phycocyan *b*; (3) red, or phycocyan *c*, and (4) probably the red phycocyan (the “Schizophyceenphykoerytrin” of Boresch) or phycocyan *d*.—The phycoerythrin group is divided into (1) the blue-green, or phycoerythrin *a*; (2) the blue, or phycoerythrin *b*; and (3) the red or phycoerythrin *c*.—The pigmentation of these algae changes with variations in the quantitative relations of the fundamental pigment components; accumulations of colored derivatives are also not without influence.—*Frederick V. Rand*.

1859. ДАНИЛОВ, А. [DANILOV, A. N.] *Дериваты фикоциана и Фикоеритрина*. [The derivatives of phycocyan and phycoerythrin.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 97–98. 1921.—The pigments of blue-green or red algae, diluted with water and acted upon by acids or alkalis produce solutions with definite spectra, displaying a mixture of pigments. A table is given of the spectroscopic properties of different derivatives. The author doubts the protein nature of the pigments; it is more probable that the pigments are dissolved in the proteins.—*V. Malchevski*.

1860. EARL, JOHN CAMPBELL. *The chemistry of Posidonia fibre. Part II. The cellulose*. Jour. Chem. Soc. [London] 125: 1322–1323. 1924.

1861. FRANZEN, HARTWIG, AND FRITZ HELWERT. *Über die chemischen Bestandteile grüner Pflanzen. XXV. Mitteilung. Über die Säuren der Apfel (Pirus malus)*. [The acids of the apple (Pirus malus).] Zeitschr. Physiol. Chem. 127: 14–38. 1923.—The acids of the apple consist mainly of malic with a relatively large amount of citric, small amounts of succinic and lactic, a very small amount of oxalic acid, and a trace of unsaturated acids.—*H. R. Kraybill*.

1862. FRANZEN, HARTWIG, AND RUDOLF OSTERTAG. *Über die chemischen Bestandteile grüner Pflanzen. XVIII. Über die durch Bleiacetät fällbaren Säuren der Vogelbeeren (Pirus aucuparia)*. [Chemical constitution of green plants. Acids of Pirus aucuparia precipitable by lead acetate.] Zeitschr. Physiol. Chem. 119: 150–165. 1922.—Malic acid is the principal acid found, with traces of citric and succinic acid. Notable amounts of tartaric and citric acids, as reported by Liebig, were not found.—*Chas. A. Shull*.

1863. HAGAN, WILLIAM A. Formation of peroxide by *Actinomyces necrophorus* on exposure to air in relation to anaerobic plate cultures. Jour. Infect. Diseases 35: 390-400. 1924.—An obligate anaerobe, *Actinomyces necrophorus*, produced  $H_2O_2$  when young broth or meat cultures were exposed to the air. Sterile meat fragments in the medium tended to destroy the  $H_2O_2$ . The concentration of  $H_2O_2$  produced in active cultures was somewhat less than 0.01%. Hydrogen peroxide was distinctly injurious to growth of the organism and was bactericidal if exposure was continued for a sufficient period. Subcultures from cultures exposed to  $H_2O_2$  developed slowly on the new media, the length of the lag phase depending upon the concentration of the  $H_2O_2$  and the period of exposure to it. Oxygen dissolved in the media during plating for cultivation in anaerobic jars inhibited development following inoculation.—R. L. Starkey.

1864. HÄGGLUND, E., AND B. SUNDRÖS. Zur Kenntnis der Alkoxygruppen des Holzes und des Lignin von Fichte. [The ether radicles of fir wood and lignin.] Biochem. Zeitschr. 145: 221-225. 1924.—The ether radicles in fir wood were found to be methoxy groups exclusively.—H. D. Hooker, Jr.

1865. HEILBRON, I. M. Plant pigments. Jour. Soc. Chem. Indust. 43: 89-93T. 1924.—A brief review of the chemical characteristics of the several types of plant pigments is given, with a short discussion of the function of chlorophyll in photosynthesis. From theoretical considerations the author states that it is improbable that the chlorophyll complex alone could absorb sufficient energy to complete the process. If the reaction took place in stages and both of the chlorophyll pigments and the 2 carotinoid pigments are involved sufficient energy can be accounted for theoretically. Spectrographic evidence obtained from a study of pure carotin indicates that carotin is transformed into xanthophyll. Each pigment could function according to the following scheme: Chlorophyll *a* carbonic acid  $\rightarrow$  chlorophyll *b* -hydrate + HCHO Chlorophyll *b* + carotin = chlorophyll *a* + xanthophyll.—H. R. Kraybill.

1866. HENRY, T. A. The plant alkaloids. 2nd ed. viii + 456 p. 8 pl. J. & A. Churchill: London, 1924.

1867. HESS, W. R. Die Rolle der Vitamine im Zellchemismus, Erwiderung auf die Antwort Emil Abderhalden. [The role of vitamins in cell chemistry. Answer to the reply of Emil Abderhalden.] Zeitschr. Physiol. Chem. 127: 196-198. 1923.—This is a reply to Abderhalden (Zeitschr. Physiol. Chem. 122: 88-92. 1922).—Henry R. Kraybill.

1868. HUMPHREYS, FREDERICK B. Formation of acrolein from glycerol by *B. welchii*. Jour. Infect. Diseases 35: 282-290. 1924.—*Bacillus Welchii* alone or together with *B. proteus*, *B. pyocyaneus*, *B. coli*, *Vibrio* "septica," or *B. oedematiens*, after development on glycerol media, failed to grow upon subplanting. Acrolein was found in all glycerol cultures of *B. Welchii*. This substance is strongly bactericidal and is believed to be responsible for the destruction of the cells in glycerol media. Dextrose cultures of *B. Welchii* and glycerol broth cultures of other organisms gave no test for acrolein. It is believed that acrolein formation from glycerol is diagnostic for the group.—R. L. Starkey.

1869. KELLY, FRANK B., AND HARRY GUSSIN. Studies on respiratory diseases. xix. Untreated bile as a solvent for pneumococci. Jour. Infect. Diseases 35: 327-333. 1924.—The bile preparations which are commonly used proved less effective for dissolving cells of pneumococci than stored, untreated, whole ox bile. Dextrose broth is readily dissolved in this bile without interference from precipitation.—R. L. Starkey.

1870. KHOUVINE, Y. Digestion de la cellulose par la flore intestinale de la homme. *B. cellulosa dissolvens*, n. sp. [Digestion of cellulose by the flora of the human intestine. *B. cellulosa dissolvens*, n. sp.] 108 p. 8 fig. Thesis, Paris, 1923.—Imprimerie de la cour d'appel: Paris, 1923.—A new anaerobic bacterium, *Bacillus cellulosa dissolvens* n. sp., was isolated from human feces in 60 cases out of 100. This organism forms terminal clostridial spores which are very resistant to heat and antiseptics. It requires N in an organic form, feces itself serving as the best source, and it decomposes cellulose very rapidly, particularly when in impure cultures with other intestinal bacteria. Sixty per cent of the cellulose decomposed was accounted for in the by-products  $CO_2$ ,  $H_2O$ ,  $H_2$ ,  $C_2H_5OH$ ,  $CH_3COOH$ ,  $C_3H_7COOH$ , and a yellow pigment. A review of the literature on cellulose decomposition is given, which is particularly thorough in regard to decomposition in the intestinal tract of animals. A bibliography of more than 250 entries is appended.—C. E. Skinner.



1871. Любименко, В. [LUBIMENKO, V.] О хлорофилле в отложениях озерного ила. [Chlorophyll in precipitations of lake mud.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 50. 1921.

1872. Любименко, В. [LUBIMENKO, V.] О связи хлорофилла с белками Живых пластид. [The association of chlorophyll with the proteins of the living plastids.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress.] 1: 45-46. 1921.—Chlorophyll extracted from leaves by the usual solvents is an altered pigment. In order to obtain an unchanged pigment from a living tissue, the author extracted it by grinding leaves of *Aspidistra* and *Junkia* in water. After filtration through an asbestos filter the author obtained a stable transparent solution. Considering the great constancy of the pigment in an H<sub>2</sub>O extract, in respect to the action of light and of acids, which is lost when the proteins are coagulated, the author supposes that the chlorophyll is chemically connected with the proteins of the plastids.—V. Malchevski.

1873. POWELL, WALTER JAMES, AND HENRY WHITTAKER. The determination of pentosans in wood cellulose. Jour. Soc. Chem. Indust. 43: 34T-36T. 1924.—A volumetric method for determining the pentosan content of cellulose is described. The results by the new method compare favorably with those of the gravimetric method.—Henry R. Kraybill.

1874. RETTGER, LEO F., GEORGE F. REDDISH, AND JAMES G. McALPINE. The fate of bakers' yeast in the intestine of man and of the white rat. Jour. Bact. 9: 327-337. 1924.—When yeast was fed to men or to rats, most of the cells recovered in the feces were dead although a few were still viable as shown by growth on media. After the yeast diet was discontinued the number of yeast cells rapidly diminished until, after 3 days they had disappeared. A yeast diet made no effect on the number of acidophilous or other Gram-positive bacteria in the feces. Subcutaneous, intraperitoneal, or intravenous injection of living yeast cells into mice, guinea-pigs, or rabbits caused little or no deleterious effects.—C. E. Skinner.

1875. ROBERTSON, R. C. Food accessory factors (vitamines) in bacterial growth. IX. Growth of several common bacteria in a synthetic medium and relation of substances formed by them to growth of yeast. Jour. Infect. Diseases 35: 311-314. 1924.—*Saccharomyces cerevisiae*, *Bacillus diphtheriae*, *B. dysenteriae*, *B. typhosus*, *B. paratyphosus* A and B, *Staphylococcus albus*, *Staph. aureus*, *Spirillum chlorae*, and *Sp. Metchnikovi* failed to develop following repeated transfer upon a synthetic medium. *B. coli*, *B. prodigiosus*, *B. proteus*, *B. pyocyaneus*, *B. subtilis*, and *Sarcina lutea* were carried through 50 successive transfers on the synthetic medium. Sterile filtrates from cultures of this 2nd group of organisms supported growth of the yeast in every case through 50 transfers. It is believed that growth-promoting substances, essential to growth of the yeast, are produced by these organisms.—R. L. Starkey.

1876. SABALITSCHKA, T., AND H. RIESENBERG. Über die Ernährung von Pflanzen mit Aldehyden. IV. Verhalten und Nachweis von Formaldehyd in Pflanzen und Pflanzensubstanz. [Plant nutrition and aldehydes. Behavior and evidence of formaldehyde in plant tissue.] Biochem. Zeitschr. 145: 373-378. 1924.—Colorimetric determinations with phloroglucin in alkaline solution indicated that fresh leaves exposed to formaldehyde vapor contained less than 0.05% formaldehyde, dried leaves 0.02%, dried and extracted leaves 0.01% and the residue of the extract none. Fresh leaves growing in the open showed no trace of formaldehyde.—H. D. Hooker, Jr.

1877. SUPNIEWSKI, J. Der Stoffwechsel der cyclischen Verbindungen bei *Bacillus pyocyaneus*. [Metabolism of cyclic compounds in *Bacillus pyocyaneus*.] Biochem. Zeitschr. 146: 522-535.—*Bacillus pyocyaneus* is not able to decompose the majority of benzol derivatives. Animo-benzol compounds are poor sources of N. Salicin is decomposed and the saligenin is oxidized to salicylic acid. Tyrosine is completely decomposed. Tryptophane is broken down to (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> and indol which appears to be converted to anthranilic acid. Ammonium carbonate is formed from anthranilic acid, but not from *p*- or *m*-aminobenzoic acid. In the decomposition of amino acids by *Bacillus pyocyaneus* the carboxyl group is removed first and ammonia arises.—H. D. Hooker, Jr.

1878. Успенский, Е. [USPENSKI, E.] Угольные культуры хвощей. [Carbon cultures of *Equisetum*.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 26-27. 1921.—Cultures were made from spores and rhizomes of *Equisetum* on carbon ob-

tained from cane sugar, in paraffined containers with Knop's solution. Analysis of the dry matter of the prothallia did not show perceptible quantities of  $\text{SiO}_2$ . The hardness of the stems equaled that of starch. The prothallia may grow in such cultures for several years.—*V. Malchevski*.

1879. WINDANS, A., AND R. WEINHOLD. Über einige Additionsverbindungen des Digitonins. [Addition compounds of digitonin.] Zeitschr. Physiol. Chem. 126: 299-307. 1923.—Digitonin addition compounds were prepared with the following:  $\alpha$ -naphthol, B, naphthol, p-bromonaphthol, thiophenol, carvomenthol, l- $\alpha$ -terpineol, d- $\alpha$ -terpineol, actetrahydro-B-naphthol,  $\alpha$ -phenylethyl alcohol and secondary octyl alcohol. All of these compounds are fairly insoluble and the amount of water of crystallization is variable. Upon extraction with  $\text{C}_2\text{H}_5\text{OH}$ ,  $\text{C}_6\text{H}_6$  or xylene compounds are resolved into their original constituents.—*H. R. Kraybill*.

1880. WREDE, FRITZ, EMIL BANIK, AND OTTON BRAUSS. Über die Konstitution des Senfölglicosids Sinigrin. [The constitution of the mustard oil glucoside, sinigrin.] Zeitschr. Physiol. Chem. 126: 210-218. 1923.—From experimental work the author believes that sinigrin is not  $\text{C}_{10}\text{H}_{18}\text{NS}_2\text{KO}_{10}$  but  $\text{C}_{10}\text{H}_{18}\text{NS}_2\text{KO}_9 \cdot \text{H}_2\text{O}$ .—*H. R. Kraybill*.

### METABOLISM (NITROGEN RELATIONS)

1881. CAMPBELL, E. G. Nitrogen content of weeds. Bot. Gaz. 78: 103-115. 1924.—Twenty six species of weeds collected in 3 stages of development and under diverse conditions of growth were investigated to determine their ability to store N. The specimens were cleaned, dried, and ground to a fine powder. Both total N and nitrate-N determinations were made of each species. For the total N determination, the Kjeldahl-Gunning method was employed. For the nitrate-N determination the Schlösing-Wagner volumetric method and the phenoldisulphonic acid colorimetric methods were employed. The result indicates that nitrate-N completely disappears at full maturity in the weeds tested. The highest percentage of nitrate was found in the stage just before blooming. Those weeds grown under abnormal conditions (on manure piles) still showed the presence of nitrate at full maturity.—*L. J. Pessin*.

1882. COMBES, RAOUL. Migration des substances azotées pendant le jaunissement des feuilles des arbres. [Migration of nitrogenous substances during the yellowing of the leaves of trees.] Bull. Soc. Bot. France 71: 43-48. 1924.—The author speaks of the disappearance of carbohydrates. In experiments with *Tilia*, *Acer*, and *Fagus*, analyses showed that much more of the original nitrogenous compounds disappeared from leaves allowed to turn yellow naturally on the trees than disappeared from leaves cut from the trees at the beginning of the process and placed, for this period, with their petioles in water. In the plants mentioned and in *Castanea* and *Aesculus*,  $\frac{1}{2}$  to  $\frac{2}{3}$  of the nitrogenous substances in the green leaves pass into the twigs, etc., during normal yellowing.—*P. A. Young*.

1883. FÜRTH, O. Kritisches und Experimentelles über die Ermittlung des Tyrosingehalt von Proteinen. II. [Determination of tyrosine in protein.] Biochem. Zeitschr. 146: 259-274. 1924.—None of the standard methods of determining tyrosine—the diazo reaction, the addition of bromine, the color reaction with phosphomolybdic acid, Millon's reaction, gravimetric determination—gives reliable quantitative results in determining the tyrosine content of protein, though all give satisfactory results with practically pure tyrosine.—*H. D. Hooker, Jr.*

1884. FÜRTH, O., AND Z. DISCHE. Kritisches und Experimentelles über die Tryptophanbestimmung in Proteinen. [Determination of tryptophane in protein.] Biochem. Zeitschr. 146: 275-296. 1924.—Tryptic digestion of protein or prolonged treatment with alkali lowers the relative color intensity obtained by the Voisenet reaction as compared with that of a standard tryptophane solution; peptic digestion or brief alkali treatment does not. This lowering of the color intensity is not considered to be due to any decomposition of tryptophane, but to the greater dependence of color development on the concentration of HCl when free tryptophane is present in the standard, as compared with tryptophane combined in protein. This color development leads to an overestimation of tryptophane. The difficulty is avoided by using in the standard a protein of known tryptophane content, such as casein, prepared according to Hammarsten.—*H. D. Hooker, Jr.*



1885. ИВАНОВ, Н. Н. [IVANOV, N. N.] О белковом веществе грибов. [The proteins of fungi.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 86. 1921.—The author extracted from *Lycoperdon pyriforme*, a substance with 16.64–16.75% of N. According to its properties and high content of diamino acids (58.1% of the total N) it is closely related to the histopeptones of animal origin. Together with it, the author always obtained a substance containing 6.40–6.72% of N with a varying quantity of P (not over 2.46%) giving when hydrolysed, glucosamin and phosphoric acid. The author concludes that this fungus has no other protein than the glucoprotein containing phosphoric acid in its molecule.—V. Malchevski.

1886. KOSTYTSCHEW, S., AND W. BRILLIANT. Die Verwandlungen der Aminosäuren in Gegenwart von Zucker. [The transformation of amino acids in the presence of sugar.] Zeitschr. Physiol. Chem. 127: 224–233. 1923.—When yeast autolysates and sugars are incubated at 30–55°C. N-containing substances are synthesized. These products are the result of the action of amino acids and  $\text{NH}_3$  upon the sugar and are precipitated by  $\text{Cu}(\text{OH})_2$ . The precipitate can be decomposed with  $\text{H}_2\text{S}$  and the sugar liberated.—H. R. Kraybill.

1887. LIEBEN, F. Über die Nitrierung einiger Eiweisskörper. I–II. [Nitration of protein.] Biochem. Zeitschr. 145: 535–559. 1924.—With 20–40% nitric acid, silk fibroin, casein, blood fibrin, serum albumin, serum globulin, milk albumin, edestin, gliadin, and keratin were nitrated to the extent of 1 nitro group for each tyrosine group and also for each tryptophane group in the tryptophane-containing proteins. The nitro groups were removed by reduction without adding amino nitrogen.—H. D. Hooker, Jr.

1888. LOEB, JACQUES. Die Erklärung für das kolloidale Verhalten der Eiweisskörper. [Explanation of the colloidal behavior of protein substances.] Naturwissenschaften 11: 213–220. Fig. 1–3. 1923.—This is a summary of Loeb's views as set forth in detail in his book on the chemistry of proteins.—Orton L. Clark.

1889. LOEB, JACQUES. L'explication de l'apparence colloïdale des protéines. [Explanation of the colloidal behavior of proteins.] Rev. Gen. Colloïdes 1: 3–17. Fig. 1–3. 1923.—It is now possible to explain the colloidal appearance of proteins quantitatively upon the basis of a rational mathematical formula.—What at first appeared to be a new chemistry—colloidal chemistry—appears now to have been only a condition of equilibrium of the older chemistry wrongly observed, at least in so far as proteins are concerned.—The error was due to 2 things: (1) failure of the colloidal chemists to measure the H-ion concentration of their solutions—which proves to be the principal variable in the case; and (2) their negligence to measure and to take into consideration the potentials of the membrane in solutions of proteins and protein gels, which furnish proof that the theory of equilibria of membranes may be employed to explain the colloidal behavior of proteins.—Frederick V. Rand.

1890. Опарин, А. [OPARIN, A.] К вопросу о регрессивном метаморфозе белков в прорастающих семенах. [Catabolism of proteins in germinating seed.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 22. 1921.—Oxidation of the products of protein hydrolysis combined with their decomposition and with splitting off of  $\text{NH}_3$  can be produced—with chlorogenic acid, widely spread in the plant world. In the presence of chlorogenic acid and  $\text{O}_2$ ,  $\alpha$ -amino acids and peptones are decomposed in germinating seed by the splitting off of free  $\alpha$ -amino groups in the form of  $\text{NH}_3$ .—V. Malchevski.

1891. Прянишников, Д. [PRIANISHNIKOV, D.] Об отношении растений к аммиаку [The relation of plants to ammonia.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 65–67. 1921.—The author considers the significance of  $\text{NH}_3$  in nutrition and as a product of metabolism, and the conditions of rapid consumption of  $\text{NH}_3$  in the formation of asparagin in the presence of carbohydrates. Experiments using  $\text{NH}_4\text{NO}_3$  with different reactions of the nutrient media have shown that the acid reaction increases the consumption of  $\text{NO}_3$  and decreases that of  $\text{NH}_4$ . Experiments with  $(\text{NH}_4)_2\text{SO}_4$ , when the solution was constantly changed at short intervals, have shown that the harmful action of this salt depends not upon the  $\text{NH}_4$  group as is sometimes taken for granted, but only upon the  $\text{H}_2\text{SO}_4$  (the acid fragments remaining after the absorption of  $\text{NH}_4$ , were removed by a constant change of solution; the plants thrived). The N of  $\text{NH}_4$  is distributed between the amino and amid groups, but the author points out that sometimes there is a disagreement in determina-

tions of asparagin (Sachs' method) when the sum of N in asparagin, in protein and in  $\text{NH}_3$  equals the whole quantity of N and nothing is left for the amino acids. In this case apparently the amino group belongs not only to the asparagin but the 2nd carboxyl group of asparagin is substituted by an amido group (formation of the diamid of aspartic or malic acid). These cases require further investigation, for it is possible that they contain the solution of problems connected, with "ammonia poisoning of starving seedlings."—V. Malchevski.

1892. Сабинин, Д. [SABININ, D.] К. изучению проницаемости протоплазмы. [Studies on the permeability of protoplasm.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 35. 1921.—Colorimetric determinations were made of changes in concentrations of the ions  $\text{NH}_4$  and  $\text{NO}_3$  after the roots of the seedlings had been placed in the solution. The immersion of the roots is immediately followed by a decrease in the concentration, determined for  $\text{NH}_4$  salts as equaling 5-30%. In greatly diluted or highly concentrated solutions the adsorption is weaker. When continuously left in the solution the seedlings slowly absorb the salts. Acidity of the media decreases adsorption and delays the entrance of  $\text{NH}_4$  but increases adsorption and accelerates the entrance of  $\text{NO}_3$ . Addition of alkali, on the contrary, increases adsorption and accelerates entrance of  $\text{NH}_4$  but diminishes adsorption and retards entrance of  $\text{NO}_3$ .  $\text{NH}_4\text{NO}_3$  changes its character in relation to physiological acidity and alkalinity independently of the change of reaction of the medium.—V. Malchevski.

1893. Смирнов, А. [SMIRNOV, A.] Синтез кислотных амидов в растениях. [Synthesis of acid amids in plants.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 91-92. 1921.—The author shows the influence of non-nitrogenous acids of definite structure, upon the synthesis in the plant of amids of similar structure. The experiments were made with corn and lupine using the method of pure cultures described by the author. Ammonium salts of malic, succinic, and aspartic acids served as a basis for the synthesis. The author reports the synthesis of asparagin. Conclusions concerning the quantity of amids formed were made from the quantity of amid N determined by the Sachs method, taking account of the free ammonia N. In accordance with the supposition made, the quantity of amid N increases absolutely and relatively when seedlings are nourished with  $\text{NH}_4$  salts of organic acids.—V. Malchevski.

1894. STEUDEL, H., UND S. IZUMI. Über die Hefennucleinsäure. V. Darstellungsmethoden der Hefennucleinsäure. [Yeast nucleic acids. V. Methods of preparation of yeast nucleic acids.] Zeitschr. Physiol. Chem. 131: 159-165. 1923.

1895. STENDEL, H., UND E. PEISER. Über die Hefennucleinsäure. IV. Eine einfache Methode zur Isolierung der Adenylnsäure. [Yeast nuclei acids. IV. A simple method for the isolation of adenylic acid.] Zeitschr. Physiol. Chem. 127: 262-267. 1923.—Five hundred gm. of yeast nucleic acids in 100 gm. lots were dissolved in NaOH and precipitated with alcohol and the operation was repeated. The precipitate was dissolved in  $\text{H}_2\text{O}$  and guanylic acid precipitated by neutralizing with acetic acid. The yield was 87 gm. of tertiary Na salt. The combined filtrates were neutralized with lead acetate. Lead was removed by  $\text{H}_2\text{S}$ , the solution neutralized with  $\text{NH}_4\text{OH}$  and after concentration precipitated with alcohol. A flocculent precipitate was obtained which proved to be more guanylic acid. The filtrate was precipitated again with lead acetate, the lead removed and the solution concentrated; 57.5 gm. of adenylic acid crystals resulted.—H. R. Kraybill.

1896. TAKAO, KATSUMI. Über den Abbau des d-Glucosamins durch Mikroorganismen. [The decomposition of d-glucosamine by micro-organisms.] Zeitschr. Physiol. Chem. 131: 307-318. 1923.

#### METABOLISM (ENZYMES, FERMENTATION)

1897. ANDERSON, BELLE G. Gaseous metabolism of some anaerobic Bacteria. XX. Experimental data. Jour. Infect. Diseases. 35: 244-281. 1924.—Extensive studies were conducted with the gas production of 25 strains of the anaerobes *Bacillus Welchii*, *B. botulinus*, *B. sporogenes*, *B. centrosporogenes*, "Vibron septique," *B. bifementans*, *B. histolyticus*, and *B. tetani* on peptone media containing different proportions of organic and inorganic compounds. The total amounts of gas produced by the same organism varied greatly at different



times. The proportional amounts of  $\text{CO}_2$ ,  $\text{H}_2$  and  $\text{N}_2$  produced by the same strain under like conditions were very constant even at different times. Proteolytic organisms evolved more gas from peptone than did saccharolytic organisms. Proteolytic organisms which produced mainly  $\text{CO}_2$  from peptone gave  $\text{CO}_2:\text{H}_2$  ratios of 6–45. *B. Welchii* produced comparatively small amounts of gas from peptone media and the gas was rich in  $\text{H}_2$ . The  $\text{CO}_2:\text{H}_2$  ratios for this organism in peptone were 0.15–0.4. In the presence of 1% Na formate or NaCl larger proportions of  $\text{H}_2$  were produced. In the presence of glucose in the peptone medium much more gas was produced. No striking differences were observed between the amounts of gas produced by the proteolytic and saccharolytic types in this medium. Consumption of the carbohydrate varied greatly but there was no correlation between gas production and utilization of glucose. Less than 0.7% of the glucose was decomposed in 3 days. The ratios of  $\text{CO}_2:\text{H}_2$  were lower with all except *B. Welchii*. During the first 3 days of growth, gas production was more active than during the following 4 days. Slightly higher percentages of  $\text{H}_2$  were produced during later periods of incubation. Less gas was produced in media containing small amounts of peptone. This was most pronounced with the saccharolytic organisms. The presence of  $\text{Na}_2\text{HPO}_4$  increased gas production. In the presence of  $\text{NaNO}_3$  the ratio  $\text{CO}_2:\text{H}_2$  by *B. Welchii* was increased as much as 90 times, due to a decrease in the production of  $\text{H}_2$ . *B. Welchii* appears to reduce nitrates to nitrites and gaseous N. Sheep serum increased gas production—the  $\text{H}_2$  in larger amounts than the  $\text{CO}_2$ . By decreasing the volume of medium and increasing the volume of evacuated space in the container, gas production per unit of medium was greatly increased. Some strains were consistently low and others high in gas production. The consistently slight gas production by certain strains was believed to explain the lack of swelling of tins of food harboring these anaerobes.—*R. L. Starkey*.

1898. BANTHEL, CHR., UND H. VON EULER. *Milchsäuregärung der Glucose durch Peptone*. [Lactic acid fermentation of dextrose by peptone.] *Zeitschr. Physiol. Chem.* 128: 257–283. 1923.—Schlatte's results (*Biochem. Zeitschr.* 131: 362–81. 1922.) were probably due to bacterial contamination. No lactic acid was formed when experiments were carried out aseptically.—*H. R. Kraybill*.

1899. Благовещенский, А. [BLAGOVESHCHENSKI, A.] *К вопросу о синтезирующем действии растительных протеаз*. [On the synthetic action of plant proteases.] *Дневник Русского Ботанического Конгресса* [Jour. Russian Bot. Congress] 1: 21. 1921.—By the action of enzyme preparations from germinating seed of *Phaseolus Mungo* on a suspension of leucin in  $\text{H}_2\text{O}$ -free glycerol, products containing fewer amino groups are formed. The latter are shown by titration according to the method of Sørensen. Qualitative reactions show the presence of leucin-imid. The same decrease of free amino N may be observed when the enzyme acts upon glycine. The presence of  $\text{H}_2\text{O}$  suppresses the synthetic action.—*V. Malchevski*.

1900. Благовещенский, А. [BLAGOVESHCHENSKI, A.] *О специфическом действии растительных протеаз*. [The specific action of plant proteases.] *Дневник Русского Ботанического Конгресса* [Jour. Russian Bot. Congress] 1: 21–22. 1921.—In a study of the action of proteases from germinating seed of *Phaseolus Mungo*, *Cannabis sativa* and *Brassica rapa*, on reserve globulins of the seed of these same plants, it is shown that the enzyme acts most rapidly on the proteins of the same plant, and very slightly or not at all on proteins of different origin.—*V. Malchevski*.

1901. ERNSTRÖM, EFR. *Über die Temperaturkoeffizienten der Stärkespaltung und die Thermostabilität der Malzamyase und des Ptyalins*. [Temperature coefficients of starch hydrolysis and the thermostability of malt amylase and ptyalin.] *Zeitschr. Physiol. Chem.* 119: 190–263. *Fig. 1–17*. 1922.—The temperature coefficient of starch hydrolysis is fairly constant between 10° and 30°C. but falls off with increasing temperature. For malt amylase the coefficient "A" in the Arrhenius temperature formula has a value of 18000 from 0–10°C., 13000 at 10–20°C., 12000 at 20–30°C., and 8000 at 30–40°C. The formula does not hold well for malt amylase. Sodium chloride depresses malt amylase digestion in concentrations greater than 0.026 N. At 54–56°C., malt amylase loses half its activity by a 1-hour treatment; and 1 hour at 60°C. completely destroys action. The inactivation does not follow a monomolecular course. The influence of acidity and NaCl on the behavior of both malt amylase and ptyalin is discussed.—*Chas. A. Shull*.

1902. EULER, H., VON, UND K. JOSEPHSON. Inaktivierung der Saccharase durch Halogenen. [Inactivation of sucrose by halogens.] *Zeitschr. Physiol. Chem.* 127: 99-114. 1923.—The poisonous action of Iodine depends largely upon the incubation period. Sucrose solutions incubated with small amounts of I were reduced to about  $\frac{1}{2}$  their normal activity. With large periods, decrease in activity was shown, but after 16 hours the activity was entirely inhibited. One gram-atom of I reduces the activity of 20 kgm. of sucrose, of inversion power 230, to half its ordinary value. Bromine shows inhibitory power without any period of incubation.—*H. R. Kraybill.*

1903. EULER, H. VON, UND K. MYRBÄCK. Sorption von Saccharase durch Tonerdehydrat. [Adsorption of sucrose by Aluminum hydroxide.] *Zeitschr. Physiol. Chem.* 127: 115-124. 1923.—Phosphates inhibit the adsorption of sucrose by  $\text{Al}(\text{OH})_3$ . Acetone increases the adsorption, but the enzyme is destroyed.—*H. R. Kraybill.*

1904. EULER, J. VON, UND K. MYRBÄCK. Verlauf der Rohrzuckerinversion durch Saccharase. [Kinetics of cane sugar inversion by sucrose.] *Zeitschr. Physiol. Chem.* 129: 100-105. 1923.

1905. FLURY, R. Zur Frage des Vorkommens, der autolytischen Neubildung sowie der physiologischen Bedeutung der Milchsäure in pflanzenlichen Geweben. [The occurrence, autolytic synthesis and physiological significance of lactic acid in plant tissues.] *Biochem. Zeitschr.* 146: 297-301. 1924.—No lactic acid-producing enzyme could be found in yeast, spinach, lupines or potatoes.—*H. D. Hooker, Jr.*

1906. HEDGES, ERNEST SYDNEY, AND JAMES ECKERSLEY MYERS. The periodic catalytic decomposition of hydrogen peroxide. *Jour. Chem. Soc. [London]* 125: 1282-1287. 2 fig. 1924.—A periodic decomposition of  $\text{H}_2\text{O}_2$  can be brought about by the use of certain substances, mainly metals, alloys or amalgams. Of biological interest is the fact that catalase of sheep's liver and ox blood gave periodic decomposition of  $\text{H}_2\text{O}_2$ , but catalase of potato and cabbage did not.—*F. E. Denny.*

1907. HIZUME, K. Zur Kenntnis der Diastasen. Zugleich ein Beitrag zur Frage der Zweienzymtheorie. [Diastases and the theory of two enzymes.] *Biochem. Zeitschr.* 146: 52-71. 1924.—Chlorides, bromides, dilute serum, and nitrates activated the liquefaction of starch and the production of sugar by ptyalin equally. Diastatic activity was greatly reduced by dialysis and the enzyme was completely reactivated by addition of bromine or chlorine salts. Treatment with sulphate reactivated dialysed ptyalin but did not increase the activity of native saliva. Acids and alkalis affected the 2 phases of diastase action equally. Ptyalin was protected from the destructive action of heat by maltose, glucose, chlorides, bromides, and diluted serum; to some extent by sucrose and fructose; and not at all by iodides and nitrate. Malt diastase was not activated by salt treatment and was rendered more sensitive to heat by chlorides and bromides.—*H. D. Hooker, Jr.*

1908. HOLMBERGH, O. Einwirkung von Kaliumjodid auf die Verzuckerung der Stärke durch verschiedene Amylasen. [Action of potassium iodide on the conversion of starch to sugar by various amylases.] *Biochem. Zeitschr.* 145: 244-248. 1 fig. 1924.—Potassium iodide inhibited the conversion of starch to sugar by malt and liver amylase and activated sugar formation by amylases of the saliva and pancreas. The activity of maltase was not affected.—*H. D. Hooker, Jr.*

1909. KNAPP, A. W. The fermentation of cacao. *Jour. Soc. Chem. Indust.* 43: 402-403, 431-434. 1924.—A brief discussion of the commercial methods of fermentation of cacao beans and the chemical changes occurring during the process is given, with a bibliography of 13 citations. The author reports a few experiments of his own which show that the color changes usually associated with fermentation can be obtained without the pulp, but the product does not have the full cacao aroma. The cotyledons contain the oxidase necessary to bring about the color changes from purple to brown.—*Henry R. Kraybill.*

1910. ЛЬВОВ, С. [L'vov, S.] Сбраживание маннита дрожжами [Fermentation of mannite by yeasts.] *Дневник Русского Ботанического Конгресса* [*Jour. Russian Bot. Congress*] 1: 62. 1921.—Mannite is not fermented by yeast immediately, but fermentation begins as soon as methylene blue is added in substitution of a chromogen. Methylene blue is reduced proportionally to the quantity of fermented mannite. Fermentation proceeds similarly to the normal alcohol type.—*V. Malchevski.*



1911. ЛЬВОВ, С., [L'VOV, S.] **Пависимость редцпионных прочессов дрожжей от брожения.** [The dependence of the reduction processes of yeast upon fermentation.] *Дневник Русского Ботанического Конгресс (Jour. Russian Bot. Congress)* 1: 61. 1921.—Experiments show that the action of the reductase of yeast increases with the addition of sugar, phosphates and co-enzyme; but phosphates in the absence of sugar do not accelerate reduction processes; that is, strengthening of the action of reductase requires organic phosphoric compounds which arise in the beginning of fermentation. It is possible to separate the process of fermentation from the action of the reductase (when diluted with  $H_2O$  the former process is arrested, while the latter continues). The hydrogen which is derived by the reductase in the absence of fermentation is intimately connected with the process of fermentation, apparently with the synthetical substances of fermentation.—*V. Malchevski.*

1912. NEUBERG, C. **Vom Abbau der Cellulose in der Natur.** [Breaking down of cellulose in nature.] *Naturwissenschaften* 11: 657-660. 1923.—This is a discussion of 7 different groups of micro-organisms playing a part in cellulose decomposition. The chemistry of the cellulose changes and important intermediate or end products of cellulose decomposition are referred to.—*Orton L. Clark.*

1913. NEUBERG, C., AND O. ROSENTHAL. **Über Taka-Lactase.** [Lactase in Takadiastase.] *Biochem. Zeitschr.* 145: 186-188. 1924.—Lactose was almost completely hydrolysed by Takadiastase in 200 hours to glucose and galactose.—*H. D. Hooker, Jr.*

1914. NORTHROP, JOHN H. **Ist die Hydrolyse der Eiweisskörper Pepsin und Trypsin als homogene Reaktion aufzufassen?** [Is the hydrolysis of the proteins Pepsin and Trypsin to be considered as a homogenous reaction?] *Naturwissenschaften* 11: 713-719. *Fig. 1-7.* 1923.

1915. OLSSON, URBAN. **Nachtrag zu der vorausgehenden Mitteilung über Vergiftungserscheinungen an Amylasen. Eine Methode zur Messung der Stärke-Verflüssigung.** [Supplementary contribution on amylase poisoning. A method of measuring starch liquefaction.] *Zeitschr. Physiol. Chem.* 119: 1-3. *3 fig.* 1922.—A method of comparing the rate of starch liquefaction by enzymes with and without poison is described, which involves use of glass balls falling through the digesting starch solution. The time required to fall makes possible observation of the rate of liquefaction. The results, accompanied by studies of the sugar formation, show that liquefaction occurs much more rapidly than saccharification; and the double enzyme theory of malt amylase receives new support.—*Chas. A. Shull.*

1916. OLSSON, URBAN. **Vergiftungserscheinungen an Malzamyase und Beiträge Zur Kenntnis der Stärkeverflüssigung.** [Poisoning phenomenon in malt amylase and starch liquefaction.] *Zeitschr. Physiol. Chem.* 126: 29-99. 1923.—When malt is poisoned with  $CuSO_4$ , and I, the liquefaction and saccharification processes decrease simultaneously. Aniline depresses liquefaction but not saccharification. Liquefaction conforms to the equation of a monomolecular reaction, the velocity being proportional to the amount of enzyme present. *H. R. Kraybill.*

1917. PRINGSHEIM, H., UND J. LEIBOWITZ. **Über Cellobiase und Lichenase. IV. Mitteilung über Hemicellulosen.** [Cellobiase and lichenase.] *Zeitschr. Physiol. Chem.* 131: 262-268. 1923.

1918. PRINGSHEIM, HANS, AND KARL SEIFERT. **Über die fermentative Spaltung des Lichenins.** [Fermentative hydrolysis of lichenin.] *Zeitschr. Physiol. Chem.* 128: 284-289. 1923.—On treatment with malt amylase, pure lichenin from Iceland moss gave only glucose. The optimum action was found at pH 5.0. Saliva at pH 4.2-8.4 and pancreatin at pH 5.2-7.9 gave negative results.—*H. R. Kraybill.*

1919. RHINE, LOUISA E. **Divergence of catalase and respiration in germination.** *Bot. Gaz.* 78: 46-68. *4 fig.* 1924.—The author strengthens the method commonly used in the study of catalase activity by determining the quantity of catalase preparation which is optimum for the catalase-peroxide reaction and presents factors which may be used to correct the results obtained when larger or smaller quantities of catalase preparation are employed. Catalase in seed of wheat, feterita, clover, mustard, radish, and buckwheat undergoes a decided decrease in early germination stages. The initial decrease is followed by the rise usually reported for germination. Catalase decreases slowly, becoming almost nil within 22-29 days when seed are soaked in  $O_2$ -free water. At this time, they have also lost their power to ger-

minate. When imbedded in paraffin in the dry condition the seeds do not exhibit decrease of catalase. Both embryo and endosperm undergo a decrease of catalase paralleling that of the whole seed. The subsequent rise occurs not only in the embryo but also in the endosperm, although in a much less marked degree. Respiration increases greatly and immediately when seed are under germinating conditions. Therefore, the early germination curves of respiration and catalase diverge widely. Catalase in developing seed decreases per unit of wet and dry weight. The data presented show that catalase cannot be used in all cases as an indicator of metabolism. The author believes that the experimental work indicates that catalase is not merely a by-product of metabolism but is formed as an enzyme, according to the theory of need, as a result of the stimulus of the substance which it attacks.—*S. G. Lehman*.

1920. SPIEGEL, L. *Über enzymatische Fettsynthese. II.* [Enzymatic fat synthesis.] *Zeitschr. Physiol. Chem.* 127: 208-209. 1923.—The synthesis of fatty acids and glycerin by lipase proceeds best in a medium low in water.—*H. R. Kraybill*.

1921. WEBER, FRIEDL. *Enzymatische Regulation der Spaltöffnungsbewegung.* [Enzymatic regulation of the opening of the stomata.] *Naturwissenschaften* 11: 309-316. *Fig. 1-3.* 1923.—A discussion is included of the work of Lloyd, Iljin, and others bearing on enzymatic activity in the guard cells which, by regulating the amount of osmotically active substance, controls the degree of opening of the stomata. The part played by salt ions in increasing the activity of the enzymes, thus hastening the breaking down of the starch in the guard cells, is presented in detail. The rôle of the light factor as influencing enzymatic activity is also reviewed.—*Orton L. Clark*.

1922. WILLSTÄTTER, RICHARD, UND RICHARD KUHN. *Über Spezifität der Enzyme. III.* *Die Affinität der Enzyme zu stereoisomeren Zuckern.* [Specificity of enzymes. The affinity of enzymes for stereoisomeric sugars.] *Zeitschr. Physiol. Chem.* 127: 234-242. 1923.—The presence of freshly dissolved  $\beta$ -glucose retards the rate of hydrolysis of sucrose and raffinose sucrase but  $\alpha$ -glucose has no effect. Both  $\alpha$ -glucose and  $\beta$ -glucose retard the rate of hydrolysis of maltose by maltase.  $\beta$ -glucose retards the hydrolysis of salicin and helicin by emulsion but  $\alpha$ -glucose does not.—*H. R. Kraybill*.

1923. WILLSTÄTTER, RICHARD, ERNEST WALDSCHMIDT-LEITZ, UND ALBERT R. F. HESSE. *III. Über Pankreas-Amylase.* [Pancreas amylase.] *Zeitschr. Physiol. Chem.* 126: 143-168. 1923.—The glycerol extract of the pancreas was freed from lipase by adsorption with  $Al(OH)_3$  and then from trypsin by adsorption from an alcoholic solution by kaolin. Further purification by adsorption of amylase in 50% alcohol solution by  $Al(OH)_3$  and elution of the enzyme with  $(NH_4)_2HPO_4$  in  $NH_4OH$  yielded a precipitate 10 times as active as any hitherto described. The precipitate is free from proteins but gives the Molisch reaction.—*H. R. Kraybill*.

## METABOLISM (RESPIRATION, OXIDATION)

1924. ANDERSON, BELLE G. *Gaseous metabolism of some anaerobic bacteria. XIX.* *Methods.* *Jour. Infect. Diseases* 35: 213-243. *Fig. 1-2.* 1924.—Detailed methods are presented for the cultivation of anaerobes in media in evacuated flasks and for the analysis of gases produced by these organisms. The principal gases evolved by anaerobic bacteria were found to be  $CO_2$  and  $H_2$ . Small amounts of  $N_2$  were noted. There were no traces of  $CH_4$  or  $CO$ . Oxides of N appeared in negligible amounts (0.2-0.4%). Volatile amines, mercaptans, and thioethers, although readily recognized by the foul odors produced, occurred in such small quantities that their determination seemed unwarranted.  $H_2S$  was produced in significant amounts (2-4%) but no satisfactory method for its determination was found.—*R. L. Starkey*.

1925. CERIGHELLI, R. *Sur la respiration des plantes vertes à la lumière.* [The respiration of green plants in the light.] *Bull. Soc. Bot. France* 71: 251-256. 1924.—The author concludes that green cells do not liberate  $CO_2$  under conditions favorable to photosynthesis.—*P. A. Young*.

1926. DENNY, F. E. *Effect of ethylene upon respiration of lemons.* *Bot. Gaz.* 77: 322-329. 2 *fig.* 1924.—Ethylene at concentrations of 1-1000, 1-10,000, 1-100,000, 1-1,000,000 of air, increased the respiration of green lemons. The increase in  $CO_2$  output ranged from about 100% to about 250%. After the respiration of a given lot of lemons had been increased



by the use of ethylene, a discontinuance of the ethylene applications led to a decrease. Yellowing of the ethylene-treated fruit became visible about the 3rd or 4th day, and full yellow color was developed in 6-10 days. Untreated fruit remained green during the same period of time.—*F. E. Denny.*

1927. KARSNER, H. T., H. H. BRITTINGHAM, AND M. L. RICHARDSON. Influence of high partial pressure of oxygen upon bacterial cultures. *Jour. Med. Res.* 44: 83-88. 1923.—High partial pressure of  $O_2$  was found inhibitory to the growth of 4 out of 10 cultures of bacteria studied. The effect was not influenced by the length of cultivation on artificial media, and is practically constant with various strains of the same species. Pigment formation by *Bacillus pyocyaneus* was reduced but growth was not inhibited. Growth of *Pneumococcus* was not inhibited and it is concluded that the low content of bacteria in "oxygen pneumonia" of experimental animals is probably not due to the inhibitory action of the gas.—*J. G. Leach.*

1928. SZENT-GYÖRGI, A. VON. Studien über die biologische Oxydation. I. Über die Sauerstoffaufnahme des Systems Linolensäure—SH-Gruppe. [Biological oxidation. I. Oxygen absorption by the linolic acid—SH group.] *Biochem. Zeitschr.* 146: 245-253. 1 fig. 1924.—The primary oxidation product of linolic acid under the catalytic action of the SH group is an ethylene oxide and not a peroxide.—*H. D. Hooker, Jr.*

1929. SZENT-GYÖRGI, A. VON. Studien über die biologische Oxydation. II. Über den Mechanismus und die Bedeutung der SH-Katalyse. [Biological oxidation. II. The mechanism and significance of catalysis by the SH group.] *Biochem. Zeitschr.* 146: 254-258. 1924.—Thioglycolic acid combines with atmospheric  $O_2$  to produce an active peroxide capable of oxidizing many organic compounds to  $CO_2$  with or without additional catalysers.—*H. D. Hooker, Jr.*

1930. WARBURG, O., UND M. YABUSOE. Über die Oxydation von Fructose in Phosphatlösungen. [The oxidation of fructose in phosphate solutions.] *Biochem. Zeitschr.* 146: 380-386. 3 fig. 1924.—In phosphate solution fructose undergoes auto-oxidation producing one molecule of  $CO_2$  for every 3 of absorbed  $O_2$ . Under similar conditions glucose is not oxidized. Oxidation increases with decrease in H concentration and with increase in phosphate or fructose concentration.—*H. D. Hooker, Jr.*

#### ORGANISM AS A WHOLE

1931. BLAIR, JOHN E. A lytic principle (Bacteriophage) for *Corynebacterium diphtheriae*. *Jour. Infect. Diseases* 35: 401-406. 1924.—Lytic principles for *Corynebacterium diphtheriae* were obtained from feces, peritoneal exudate, and old cultures of the organism. These lytic principles varied in their action upon different strains of the diphtheria bacillus not being active against all strains and at times not even active against their homologous strains. Some strains of the diphtheria bacteriophage were active against organisms of the colon-dysentery group. These and other bacteriophages were not specific. Both "sensitive" and "resistant" types of colonies developed from cultures treated with the lytic principle. A guinea-pig inoculated with a mixture of diphtheria bacilli and the lytic principle did not die in 4 days. The diphtheria bacillus itself was fatal to another guinea-pig.—*R. L. Starkey.*

1932. BRONFENBRENNER, J., AND CHARLES KORB. On the factors influencing the appearance of plaques of bacterial lysis. *Proc. Soc. Exp. Biol. and Med.* 21: 315-316. 1924.—A systematic study of plaque formations from pure strains showed that the average size of the plaque changes inversely with the number of bacteria susceptible to lysis present in each 1 cc. of agar; that the average size depends upon the relative concentration of young and old individuals present; that the greater the relative number of resistant bacteria, the less distinct are the spots; that the greater the concentration of the agar, the smaller are the spots.—*M. M. Brooks.*

1933. DAVISON, F. R., H. E. BREWBAKER, AND N. A. THOMPSON. Brittle straw and other abnormalities in rye. *Jour. Agric. Res.* 28: 169-172. 2 fig. 1924.—Data are presented regarding certain abnormalities—chlorophyll deficiency, male sterility, crinkled awns, with special reference to "brittle" which occurs in inbred strains of rye. Chemical analysis shows

a low crude fiber (14%) and a high pentosan (34%) content in brittle straw compared with a crude fiber content of 32% and a pentosan content of 25% on a dry weight basis in healthy rye plants. Brittle plants have a high moisture content correlated with high pentosan content. The differences in starch, pectin, ash, and sugar content of normal and brittle plants are not great in amount. Evidently the carbohydrates in brittle plants are not normally transformed into cellulose and wall-forming substances designated as crude fiber, but accumulate as pentosans. The cell wall in the normal rye is much thicker than in the brittle rye straw, and the amount of lignin in the normal rye greatly exceeds that in the brittle straw.—*F. R. Davison.*

1934. HOTCHKISS, MARGARET. Studies on the biology of sewage disposal. A survey of the bacteriological flora of a sewage treatment plant. *Jour. Bact.* 9: 437-454. 1924.—Bacteria which reduced nitrates, those which produced  $H_2S$  from proteins, and those which digested albumin outnumbered those which oxidized  $NH_3$ , nitrites, or thiosulphites in all parts of a sewage disposal plant.—*C. E. Skinner.*

1935. HOTCHKISS, MARGARET. Studies on the biology of sewage disposal. A sprinkling filter bed and its bacterial population. *Jour. Bact.* 9: 455-461. 1924.

1936. KRUEGER, A. P., AND C. L. ALSBERG. A metabolic study of *Bacterium solanacearum* E. F. S. *Proc. Soc. Exp. Biol. and Med.* 21: 534. 1924.—Media for growing this organism are described and the products of growth are enumerated.—*M. M. Brooks.*

1937. ØRSKOV, J. Experimental method for the cultivation of microbes in agar cylinders in the peritoneal cavity of animals. *Jour. Bact.* 9: 427-435. 1924.

1938. RUHLAND, W. Beiträge zur Physiologie der Knallgas bakterien. [Physiology of the gas-forming bacteria.] *Jahrb. Wiss. Bot.* 63: 321-389. 1924.—*Bacillus pycnoticus* was specially investigated. In the inorganic culture medium on which this organism was grown it is necessary to have a favorable H-ion concentration and sufficient iron. Quick growth is obtainable only at approximate neutrality. In the range pH 5.2-7.2 growth will not take place. Iron (as ferro-bicarbonate) must be present in very small quantity. With as much as 2.4 times  $10^{-6}$  mg. iron in 50 cc. of  $H_2O$ , growth will not take place. If the solution is sterilized by heat all the iron is precipitated and there will be no growth. Sterilization must, therefore, be by filtration. The "protective" action of good sources of C on the H is indirect and depends on the production of organic acids whereby the H-ion concentration is increased. Organic substances which do not cause acid formation, such as small quantities of sugar, have no effect. The growth takes place at the boundary between the nutrient solution and the environing H when the bacteria are grown on a medium under that gas. The partial pressure of gases over the medium has no effect on the growth of the organism. The "hydrogen quotient"  $Q_k$  (ratio  $H_2:O_2$ ) is above 2, with a maximum at 2.78, although it varies considerably. The temperature coefficient is about 3.5. The author discusses at length the energy relations of the bacterial reactions.—*S. F. Cook.*

1939. SCHOENHOLZ, P., AND K. F. MEYER. Effect of direct sunlight, diffuse daylight, and heat on potency of botulinus toxin in culture mediums and vegetable products. xxiv. *Jour. Infect. Diseases* 35: 361-389. *Fig. 1-3.* 1924.—Toxins produced by *B. botulinus*, types A and B became destroyed by direct sunlight in the presence of air in 90-118 hours. Under anaerobic conditions the destruction was slower. During exposure to diffused daylight, in air, diffused daylight under anaerobic conditions, and storage in the dark at cool temperatures, there was slow destruction, pronounced in the 1st case and very slow in the last case. Toxins produced in broth were rapidly destroyed at 80°C. in 4-10 minutes. Toxins produced in vegetables were more resistant to heat but the resistance varied greatly with different vegetables. In whole liquors the toxins were more resistant than in centrifuged liquors. Toxins contained in such vegetables as beets and beans were rapidly destroyed at temperatures above 80°C. In vegetables such as peas, corn, and spinach, where heat penetration is slow and uneven, toxins were not destroyed even after heating between 80° and 100°C. for 20 minutes. Food showing apparent contamination is unsafe for consumption even after thorough cooking.—*R. L. Starkey.*

1940. WAGNER, E. Biochemical activities of *B. botulinus*, type C and *B. parabotulinus*, "Seddon." xxiii. *Jour. Infect. Diseases* 35: 353-360. 1924.—Studies were concerned with



the transformations of the N of veal infusion-peptic digest with and without dextrose and in meat mash-peptic digest by *Bacillus botulinus*, type C, and by *B. paratubulinus*. These types were less proteolytic than types A and B on the same media. Consumption of dextrose was also slower. These types made less consistent development on the liquid media and no growth on anaerobic blood plates. Toxin formation was more variable than by types A and B.—*R. L. Starkey*.

### GROWTH, DEVELOPMENT, REPRODUCTION

1941. GOLINSKA, JADWIGA. Sur la tubérisation des pommes de terre cultivées des boutures. [Tuber formation in potatoes cultivated from cuttings.] *Acta Soc. Bot. Poloniae* 2: 60-63. 1924.

1942. HAM, WM. Twist in trees. *South Australian Nat.* 2: 40-41. 1921.—No regularity in "twist" was observed, those with a right and those with a left hand twist being equal in number.—*Wm. Randolph Taylor*.

1943. Исаченко, Б. Л. и А. А. Егорова. [ISACHENKO, B. L., AND A. A. EGOROVA.] Наблюдения над ростом плодового тела шляпных грибов. [Observations on the growth of the fruiting body of pileate fungi.] (French resume.) *Известия главного ботанического сада Р. С. Ф. С. Р.* [Bull. Princip. Jard. Bot. Republique Russe] 21: 109-113. 1922.—From their observations on the rapidity of growth of *Boletus rufus* the authors conclude that: (1) The stipe grows rather uniformly, giving an average increase of 1.6 cm. per day (24 hours). (2) The average increase per 24 hours in the pileus is 1.62 cm., but growth during the various periods of development differs from that of the stipe in its greater fluctuation. (3) The maximum rate of growth in the stipe occurs at the 3rd or 4th day, after which there is a decrease in rapidity. (4) Increase in the diameter of the pileus occurs within the period of growth acceleration during the first 5 or 6 days; the maximum is noted at the 4th or 5th day, after which the growth rate decreases. (5) The life of the fruiting body averages 8-10 days.—More limited observations on *Boletus scaber* and *Amanita muscaria* showed similar growth relations.—*Frederick V. Rand*.

1944. MCCLELLAND, T. B. The photoperiodism of *Tephrosia candida*. *Jour. Agric. Res.* 28: 445-460. 4 pl., 7 fig. 1924.—The range in day-length in the Tropics, though much more restricted than in the temperate regions, is sufficient to exert a marked influence on plant growth. A study of its effect on *Tephrosia candida*, a tropical legume, showed that both time of blossoming and character of growth were determined by length of day. Artificial manipulation of the duration of light exposure (day length) induced both heavy blossoming out of season and inhibited blossoming in season. Blossoming was inhibited both by a day-length shortened to 10 hours, and by a day-length of 13.2 hours (length of the longest summer days in Mayaguez, P. R.). Shortening the day-length from the long day of summer to a 12-hour length promptly induced blossoming, whereas a continuation of exposure to the long summer day inhibited it. Exposure to a 12½ hour day-length, later reduced to 12 hours, was less effective than the reduction from the longer day; and reversing the procedure, by extending the day-length from 10 to 12 hours, was still less effective in bringing on the reproductive stage. Bud formation induced by the intermediate day-length of spring in most instances was not followed by summer blossoming, the reproductive stage being arrested by the longer days and vegetative growth being resumed. The interval between the 1st appearance of the buds and the opening of the flowers was directly related to the day-length, as the days shortened the interval proportionally shortened. All plants 6 months old or older, but none much younger than 4½ months, may be expected to blossom at the annual blossoming season, younger plants remaining without blossoms until the return of the favorable day-length a year later. Growth was affected in a pronounced and decided manner, the longer days causing the development of longer internodes and larger leaves.—*Author*.

1945. MANEVAL, W. E. A method of securing spores of yeast. *Bot. Gaz.* 78: 122-123. 1924.—After keeping cakes of Fleischman's yeast in the ice chest for 6-8 days the author found that there were an abundance of endospores in the surface layer. None were found in the interior of the cakes but if the cakes were broken open, they developed on the broken

surfaces in a few days at room temperatures or in the ice chest. A method for staining the spores is given. Pure cultures may be obtained by plating on potato dextrose (2%) agar, and isolating. These pure cultures are transferred to the following medium: distilled water, 100 cc.; Liebig's beef extract, 0.3 gm.; NaCl, 0.5 gm.; dextrose 0.25 gm.; agar, 1.5-2 gms., sterilized at 12-15 pounds pressure. After 4-5 days growth on this medium there is a very good spore production, and in 8-12 days practically 50% of all cells have formed spores.—*I. V. Shunk.*

1946. OELKERS, F. *Beitrag zur Kenntnis der Sporenbildung bei den Saccharomyceten.* [Spore formation in the *Saccharomycetes*.] *Jahrb. Wiss. Bot.* 63: 142-157. 1924.—The yeasts investigated, *Saccharomyces Odessa*, *S. Johannisberg*, and a *Saccharomyces* of H. Christof show an optimum spore formation at approximately pH 7.2. At pH 4.8 and 8.2 the upper and lower limits are not reached. A mixture with bacteria aids sporulation, due to the buffer action of the bacteria. Adsorptive material in the culture also aids sporulation, likewise due to a buffer action, for by the adsorption of the H-ion a pH value nearer the optimum is obtained. *S. Odessa*, together with other wild yeasts, loses the spore-forming power on long cultivation in the laboratory. By drying the cultures in the sporulated condition the power to form spores may be regenerated.—*S. F. Cook.*

1947. REED, H. S. *Growth and differentiation in apricot trees.* *Univ. California Publ. Agric. Sci.* 5: 1-55. 18 fig. 1924.—A quantitative investigation of the problems of dormancy, growth, and differentiation of the branches of the apricot (*Prunus armeniaca*). The pattern of the branches is the result of a growth process which leads to a quantitative distribution of matter in space. The branches were less variable in respect to length than in any other character. The correlation between number of laterals per branch and length of branch was much less than that between length of branch and length of laterals borne upon it. Branches on the north side of the trees produced the maximum number of primary laterals and blossoms. The production of laterals and blossoms appear to depend, not upon chance factors of the environment, but upon fundamental internal conditions of differentiation. These internal conditions are obviously grounded in the basic growth tendencies of the cells, and are especially conditioned by certain inescapable spatial limitations. A striking result of these conditions is that relatively large growth occurs in a few buds and shoots, while relatively slight or no growth occurs in many buds and shoots. There appeared to be little or no real difference in the proportionate capacity of branches with different numbers of nodes to produce primary laterals. The cyclic distribution of primary laterals on the branch indicated that the production of material of which laterals are formed follows the same mathematical relations as does the growth of the branch itself. A method is described by which it is possible to compute the length of a lateral situated at a given node. There is rather a high positive correlation between the mean numbers of primary and secondary laterals per branch as well as between their mean lengths. Blossoms were principally produced on primary laterals. The mean number of blossoms per lateral tended to be rather constant regardless of the length of the lateral, indicating that the random factors of the environment were less important than internal factors of differentiation in determining distribution. The blossom-node surface gave good evidence of the occurrence of 2 classes of laterals on apricot branches; the larger class showed a tendency toward a linear regression of blossoms on nodes, while the smaller class was characterized by the possession of many nodes and few blossoms, and showed no definite tendency toward linear regression.—*Author.*

1948. REID, MARY ELIZABETH. *Relation of kind of food reserves to regeneration in tomato plants.* *Bot. Gaz.* 77: 103-110. Fig. 1-2. 1924.—It was very noticeable that in cuttings high in N, grown in the light in a nutrient solution lacking in nitrates, considerable shoot growth resulted, and that in some cases more growth resulted than if nitrates were present in the solution. The presence of nitrates in the nutrient solution in the case of N-high cuttings appeared to be unfavorable for root growth. If the carbohydrate reserves are exceedingly limited, the nutrient solution containing nitrates may also be unfavorable for shoot growth. In striking contrast with this condition, the same sort of solution favored development of shoots from cuttings high in carbohydrates. In this case root growth was also



favored, although to a less extent. In general it seems that when the carbohydrate reserve is high and the N supply within the plant or within the nutrient solution is low, there may be vigorous root growth. When the relative percentage of N, either within or without, is slightly higher, there may also be a vigorous shoot growth.—*Author*.

1949. TIFFANY, L. H. A physiological study of growth and reproduction among certain green algae. *Ohio Jour. Sci.* 24: 65-99. 1 pl. 1924.—Pectose was found in the outer cell wall layer of *Zygnemaceae* in the vegetative state, in the outer spore wall of *Spirogyra illinoensis* and *S. stictica*, in the middle lamella of the cross walls of *Spirogyra*, *Mougeotia* and *Zygnema*, at the extremities of the cellulose  $\pi$  pieces of *Microspora Willeana* and in the sheath about *Cylindrocapsa*. Chitin was found in the outer layer of the vegetative cells of *Cladophora*, *Pithophora* and species of *Oedogoniales* except in those parts of the holdfasts attached to the host, and also in the middle cell wall layer of the zygospores and aplanospores of *Zygnemaceae*. Pectose was transformed into pectin during filament fragmentation in *Zygnemaceae*. The amount of pectose material in the cell wall decreased with age. The attachment of epiphytic algae is by a gelatinous layer of pectose. The chief food reserves of green algae are starches and oils. Arabin and galactan were found. Tannin occurred during reproduction, but disappeared before maturity. Iron was found in the chloroplasts; potassium was noticed near the oppressed areas of the conjugating tubes of *Zygnemaceae*. Calcium was observed in the larger *Oedogoniales*. Constant artificial illumination shortened the life cycle of *Pithophora varia* and hastened spore formation in *Spirogyra majuscula*. Calcium appeared necessary for cross-wall formation in the septate filamentous algae.—*H. D. Hooker, Jr.*

1950. WYLIE, R. B. Some wound responses of foliage leaves. *Proc. Iowa Acad. Sci.* 29: 239-244. 1922 [1924].—Wounds are protected 1st by drying of wounded cells, often with curling in of epidermis. Divisions in the mesophyll follow, making a firm layer of cicatrice tissue as thick as the palisade of the leaf, and as resistant as the epidermis. "The completed cicatrice reveals the cambium-like behavior of those cells which by mitosis established the healing layers."—*H. S. Conard*.

### MOVEMENTS OF GROWTH AND TURGOR CHANGES

1951. GADECEAU, EMILE. Le sommeil des plantes. [The sleep of plants.] *Bull. Soc. Bot. France* 71: 145-150 1924.—The author used the xerophytic *Oxalis carnosus*, which has hypophyllous stomata. He says that the lower surface of the leaf, when magnified, exhibits areas appearing like bunches of grapes, which he believes are water reserves. These give the surface a crystalline appearance. The leaflets fold together at night or under strong winds.—*P. A. Young*.

1952. GUHMAN, H. Variations in the root system of the common everlasting (*Gnaphalium polycephalum*). *Ohio Jour. Sci.* 24: 199-208. 1 pl. 1924.—The root systems of *Gnaphalium polycephalum* growing on well drained slopes showed positive geotropism, those of plants on even flats showed diageotropism. The roots of sunflower and tomato plants grown in well drained soil grew downward and had few laterals. When these plants were grown in soil with an excess of  $H_2O$  the tap roots turned at right angles and the sunflower roots had many long laterals. When air was introduced into the excess  $H_2O$  the roots grew downward and the sunflower roots had long laterals.—*H. D. Hooker, Jr.*

1953. KEEBLE, FREDERICK. The plant commonwealth and its mode of government. *Nature* 114: 13-15, 55-59. 1924.—This is a discourse delivered at the Royal Institution, March 21, and is a popular presentation of response to stimuli.—*O. A. Stevens*.

1954. RAWITSCHER, FELIX. Reizgrösse und Reizreaktion im Pflanzenreich. [Amount of stimulus and reaction to stimuli in the plant kingdom.] *Naturwissenschaften* 11: 491-497. 1923.—This is a review of the important papers of recent years bearing on this problem.—*Orton L. Clark*.

1955. SEIDEL, K. Untersuchungen über das Wachstum und die Reizbarkeit der Wurzelhaare. [Investigations on the growth and irritability of root hairs.] *Jahrb. Wiss. Bot.* 63: 501-552. 1924.—Experiments were made on representative species of the following fam-

ilies: *Chenopodiaceae*, *Polygonaceae*, *Gramineae*, *Caryophyllaceae*, *Cruciferae*, *Leguminosae*, *Urticaceae*, *Solanaceae*, *Scrophulariaceae*, *Onagraceae*, and *Plantaginaceae*. It was found that the root hairs of these plants were not thigmotropic. The membrane at the tip of the root hair possesses a considerable plasticity. All the phenomena which seem to indicate a thigmotropic irritability can be explained by the rapid growth and plasticity of the hair tip. Most of the root hairs showed positive chemotropism and in each case a specific ion alone in great excess was the stimulus. The *Chenopodiaceae* and *Polygonaceae* are very sensitive to phosphates, the *Gramineae* to  $\text{NH}_4$  salts, and the *Caryophyllaceae* to nitrates. The thresholds of stimuli are constant and Weber's law is here effective. Negative chemotropism can not be obtained by high concentration, nor by acids, bases,  $\text{O}_2$  or  $\text{CO}_2$ .—*S. F. Cook*.

1956. WOYCICKI, Z. Recherches sur la déhiscence des antheres et le rôle du stomium. [Studies on the dehiscence of the anthers and the role of the stomium.] Rev. Gén. Bot. 36: 196–212, 253–368. 1924.—The author comes to the following conclusions: (1) It is necessary to distinguish in the region of the apex of the partition and the apices of the valves of the anther (a) the large epidermal cells, called the stomium by Chamberlain and Coulter which, according to Goebel, play the role of "Schwellgewebe," (b) the crampon or union, composed of some small cells which unite the 2 valves, and (c) the binding parenchyma which is composed of specific cells and makes up the apex of the partition which separates the lacunae of the anther. (2) It is necessary to distinguish (a) the separation of the valves of the anther and (b) the dehiscence of the anthers or the recurving of the valves themselves. (3) The separation of the valves of the anther is preceded by the detachment of the valves from the partition. During this detachment the valves are united by the crampon. (4) The cause of the detachment of the valve from the partition is the destruction of the intercellular substance in the apical region of the partition. (5) As these experimental studies show, and as is also shown in those cases in which the anthers, being nearly empty, or enclosing very little pollen, are still able to open, the pressure of the pollen, increasing during the phenomenon of detachment, constitutes only an accessory agent. (6) The separation of the valves takes place during recurving toward the partition. When this movement is effected, the crampon, due to the specific structure of the apices of the valves possessing the stomia, undergoes very great extension and finally breaks. (7) Dehiscence of the anthers is due to increased turgescence in the cells of the valvular tissues, and chiefly in the large stomial cells. (8) At this point the pollen enclosed in the lacunae plays a remarkable role: it regulates the movement of the valves and consequently the moment of rupture of the crampon also. (9) In effect, during the 2 acts—separation of the valves and dehiscence of the anthers—the turgescence of the cells plays the decisive rôle.—*J. C. Gilman*.

1957. ZIMMERMANN, W. Untersuchungen über die plagiotropen Wuchs von Ausläufern. [Plagiotropic growth of runners.] Jahrb. Wiss. Bot. 63: 390–466. 1924.—These experiments were performed principally on *Fragaria vesca* and *Ranunculus repens*. The plagiotropic growth of runners is conditioned by the action of 2 antagonistic stimuli. One of these is always negative geotropism and the other is itself of a double nature. This is an epinasty and a positive geotropism, thus consisting of an autonomic tendency and one which is directed by gravity. The positive geotropism is retained as long as there is growth. The positive geotropism is in contrast to the negative in that the latter is more easily induced but disappears sooner than the former. The plagiotropic resting position expresses, therefore, the resultant of the bending tendencies of the 2 kinds of geotropism. This resultant is not symmetrical with the horizontal and appears to be due to quantitative differences between the opposing stimuli.—*S. F. Cook*.

#### GERMINATION, RENEWAL OF ACTIVITY

1958. Дорошенко, А. [DOROSHENKO, A.] Влияние температуры на проростание семян озимых и яровых сорняков. [The influence of temperature on the germination of winter and summer weeds.] Дневник Русского Ботанического Конгресса [Jour. Russian Bot. Congress] 1: 64. 1921.—From an investigation of about 30 species of winter weeds or



wintering annuals of southeastern Russia, the author found that all have a low temperature optimum of germination. Seed of *Asperugo procumbens*, *Capsella bursa-pastoris*, etc., cease to germinate at temperatures of 20–25°C.; other species decrease considerably the percentage germination at this temperature. Investigations with 30 species of annual weeds revealed a high optimum of germination.—V. Malchevski.

1959. PANGANIBAN, F. C. The effects of etherization on germination of tropical seeds. Philippine Agric. 13: 93–98. 1924.—After exposure to ether vapor, seed of some plants germinated late, seed of some failed to germinate, and seed of others (owing to resistant coats) were unaffected.—Sam F. Trelease.

1960. TOLENTINO, ANDRES. A viability test for some tropical seeds. Philippine Agric. 13: 129–141. 1924.—Potassium hydroxide was found to be a practical reagent for testing the viability of seed of *Oryza sativa* L., *Zea Mays* L., *Cucurbita maxima* Duchesne, *Phaseolus calcaratus* Roxb., and *Phaseolus lunatus* L. Non-viable seed discolor the KOH solution, the embryo being the part chiefly responsible for this discoloration. The test does not apply to naturally colored seed.—Sam F. Trelease.

### TEMPERATURE RELATIONS

1961. PANTANELLI, E. Influenza della nutrizione e dell'attività radicle sul collasso e il disseccamento prodotti dal freddo. [Influence of nutrition and root activity upon the collapse and desiccation produced by cold.] Atti R. Acad. Lincei Ser. 5, 29 (Semestre I): 66–71. 1920.

1962. SCOTT, WINFIELD. What is the relation between the moisture content and viability of seed corn when subjected to low temperatures? Proc. Iowa Acad. Sci. 30: 254–262. 1923 [1924].—Seed corn of high germination test was moistened to varying degrees and then frozen at –10°C. for 12–72 hours. With 35% moisture, 48 hours of freezing prevents germination; with 40%, 24 hours; with 45%, 18 hours. Seed which remained alive in exceptional cases are believed to have seed coats more resistant to penetration of water.—H. S. Conard.

### RADIANT ENERGY RELATIONS

1963. BARR, C. E. The stimulating effect of the photocytolytic products of protoplasm. Jour. Med. Res. 44: 79–81. 1923.—When an amoeba or an infusorian is cytolized by ultra-violet light, the organization of the protoplasm is destroyed and a solution escapes from the interior of the cell and diffuses into the surrounding water. Living amoebas in the vicinity of the cytolized cell are attracted to it and feed on the escaping cell contents. It is suggested that when applied to normally phagocytic cells of higher organisms this method of stimulation may lead to results of therapeutic value.—J. G. Leach.

1964. KOMURO, HIDEO. On the effect of röntgen rays upon the growth of *Oryza sativa*. (Japanese.) Bot. Mag. Tôkyô 36: (15)–(17). 1922.—Some authors have announced the fact that they have observed an increase in the crop by exposing rice grains to Röntgen rays. The author has repeated these experiments. Grains of the strain called "Sekiyama" containing nearly 17% water by 12 hours' steeping, and also air-dry grains were exposed to Röntgen rays of various doses, varying from 3 to 15H, and then pot or paddy field culture was made from them. The result of his experiments was wholly negative; in no case was he able to get an increase of crop. [See also following entry.]—Author. (Courtesy Japanese Jour. Bot.)

1965. KOMURO, HIDEO. On the effect of röntgen rays upon the growth of *Oryza sativa*. Bot. Mag. Tôkyô 36: 15–17. 1922.—This is an English translation of the preceding entry.—Author. (Courtesy Japanese Jour. Bot.)

1966. KOMURO, HIDEO. Studies in the effect of röntgen rays upon the development of *Vicia faba*. (Japanese.) Reprint from Keiô Igaku [Keiô Med. Jour.] 35: p. 1921.—Seed of *Vicia faba*, belonging to the races Sengokukurome and Hyôgo, which were steeped in water for 24, 31, 34, 46 and 77 hours, respectively, and came to contain 50–63% H<sub>2</sub>O, as well as air-dried seed whose H<sub>2</sub>O content is about 11–14%, were exposed to Röntgen rays of 7H, 10H, 15H, 20H, 30H, 40H, 50H, 60H, 80H, 100H, 120H, 150H and 155H. Giba's water cooled tube

was used, the hardness being 4.5-6° of Benoist; the current passing through it was 10 milliamperes. In general, 5H was gained by 6-7 minutes exposure, while 50H was gained by 45 minutes, and 100H by 99 minutes exposure.—As the result of 9 experiments the writer obtained, among others, the following new facts. Strongly irradiated seed (155H) in air-dried and steeped condition do not stop their development immediately, and they are still able to germinate and develop to a certain extent. When we irradiate seed containing much H<sub>2</sub>O and sow them, the shoot does not appear above the soil, and their development under the ground ceases at almost the same stage of growth, irrespective of doses given. When the dose exceeds a certain limit, no visible differences are discerned in degree of injury according to the dose given. From these results the writer believes it very probable that strongly irradiated seed are particularly affected in the plumule and radicle; the metabolism of these parts may be so gradually modified that at a certain stage the seedlings may cease to develop at all.—*Author.* (*Courtesy Japanese Jour. Bot.*)

### TOXIC ACTION

1967. BACHRACH, E. -D. Variations biologiques d'un organisme monocellulaire. Accoutumance et anaphylaxie chez le bacille lactique. [Variations of the lactic bacillus in developing resistance.] *Ann. Sci. Nat. Bot.* 10<sup>e</sup> Sér. 6: 73-165. *Fig. 1-15.* 1924.—Response of the organism to different types of toxins, applied under different conditions, is tabulated. Resistance to poisons, developed through exposure to their effects, is found to be sometimes specific, sometimes general. This acquired resistance is stable and may be transmitted to subsequent generations. It is sometimes due to selection, but at other times undoubtedly due to changes induced in the protoplasm.—*Paul Weatherwax.*

1968. SIGMUND, W. Über die Einwirkung von Stoffwechsel-Endprodukten auf die Pflanzen. III. Einwirkung N-freier pflanzlicher Stoffwechsel-Endprodukten auf die Keimung von Samen: Ätherische Öle, Terpene u.a. [The action of N-free metabolic end-products of plants, on seed germination.] *Biochem. Zeitschr.* 146: 389-419. 1924.—The most toxic essential oil found was mustard oil which even in vapor form killed seedlings. Carnation oil and caraway oil were next in toxicity. Of the constituents of essential oils, terpineol, benzaldehyde, citrol, cinnamic aldehyde, carvone, carvacrol, thymol, apiol, safrol and methyl salicylate showed considerable toxicity.—*H. D. Hooker, Jr.*

1969. STEARN, ESTHER WAGNER, AND ALLEN EDWIN STEARN. The chemical mechanism of bacterial behavior. II. A new theory of the Gram reaction. *Jour. Bact.* 9: 479-489. 1924.—From the data accumulated from other sources and from a quantity of new data, a theory of the Gram reaction in accord with Loeb's theory of the amphoteric nature of colloids has been proposed. In solutions on the acid side of the isoelectric point of both the protein and the phosphatid of the bacterial cell, both compounds unite with acid dyes and are stained by them. On the other hand, when the reaction is on the alkaline side of both isoelectric points, only basic dyes are retained. The isoelectric point for both components of Gram-positive organisms is at a low enough pH for them to retain basic dyes, in most culture media, at least, hence their "Gram-positiveness." Gram-negative bacteria, however, have the isoelectric point for their proteins on the alkaline side of most culture media, and for the phosphatid on the acid side. In this case the protein has already combined with the phosphatid and so neither acid nor basic dyes enter into combination. Thus, they are "Gram negative." The function of the oxidizing mordant, the stabilizing action on mild alkalies, gradations of "positiveness" within a species under different conditions, and many other hitherto inadequately explained phenomena are discussed.—*C. E. Skinner.*

1970. STEARN, ALLEN E., AND ESTHER WAGNER STEARN. The chemical mechanism of bacterial behavior. III. The problem of bacteriostasis. *Jour. Bact.* 9: 491-519. 1924.—The hitherto puzzling fact that Gram-positive bacteria are very much more susceptible to the bactericidal action of basic triphenylmethane dyes than Gram-negative organisms, has been explained by the authors' new theory of the Gram stain reaction. Basic dyes combine with the proteins and the phosphatids of organisms, the isoelectric point of both constituents of which are lower than the medium in which the organisms are growing. Hav-



ing combined with the dye the organism can absorb no more nutrient material and suffers "starvation." Such organisms are Gram-positive. Gram-negative bacteria contain proteins whose isoelectric point is higher than most culture media, and phosphatids the isoelectric point of which is lower. These 2 constituents combine as conjugate proteins and prevent any further combination with either acid or basic dyes. Thus Gram-negative bacteria are much less easily killed by basic dyes than Gram-positive organisms and neither are greatly harmed by acid dyes except at extremely high concentration or at very low pH (pH 3.0 and below), below the isoelectric point of the phosphatids, which reaction itself is toxic to most bacteria.—*C. E. Skinner.*

### MISCELLANEOUS

1971. BERTHELOT, ALBERT. *Sur un nouveau potentiomètre à cadran.* Bull. Soc. Chim. Biol. 6: 683-686. 1 fig. 1924.—A simplified potentiometer devised by Berthelot and Arnoux is described. It has been in use in a number of laboratories for some months and has been found sufficiently accurate for all but the most exacting uses.—*Joseph S. Caldwell.*

1972. BERTRAND, GABRIEL. *Observations sur une méthode de microdosage du silicium et sur la tenue de certaines organes en ce métalloïde.* [Microestimation of silica and the content of this element in certain organs.] Bull. Soc. Chim. Biol. 6: 656-658. 1924.—The colorimetric method of determining silica proposed by Isaacs (Bull. Soc. Chim. Biol. 6: 157. 1924), which consists in ashing the material and heating the ash in acid solution with ammonium molybdate is not accurate when applied to tissues containing phosphoric acid, which gives the same color reactions.—*Joseph S. Caldwell.*

1973. NEUBERG, C., UND E. REINFURTH. *Über die Beziehungen der Hexose-mono-phosphorsäure zur Hexose-di-phosphorsäure.* [Relation of hexose-mono-phosphoric acid to hexose-diphosphoric acid.] Biochem. Zeitschr. 146: 589-593. 1924.—The acid phenylhydrazine salt of hexose mono-phosphoric acid osazone was prepared from both the Ba and Ca salts of hexose mono-phosphoric acid, thus showing that by moderate hydrolysis, as in osazone formation, the phosphoric acid group in the  $\alpha$  position is removed.—*H. D. Hooker, Jr.*

1974. OWENS, J. S. *Exhibit of pure science at the British Empire Exhibition.* Nature 114: 12. 1924.—This is a note on the contrast photometer exhibited. In a smoke fog, on the afternoon of November 26, in South Kensington, the air was found to contain  $2\frac{1}{2}$  mgm. of soot per cu.m., giving a light obstruction of 46% in 50 feet. At 11:45 A.M. the same day, it was 75%.—*O. A. Stevens.*

### SOIL SCIENCE

A. G. McCALL, *Editor*

B. E. LIVINGSTON, *Editor*

(See also in this issue Entries 1035, 1048, 1054, 1063, 1065, 1070, 1075, 1077, 1079, 1084, 1091, 1099, 1101, 1105, 1109, 1159, 1203, 1218, 1222, 1228, 1322, 1444, 1510, 1512, 1829, 1843, 1881)

1975. ANONYMOUS. *Efficiency of sulphate of ammonia in mixed fertilizers.* Australian Sugar Jour. 16: 227. 1924.—Experiment station tests show that  $(\text{NH}_4)_2\text{SO}_4$  is more efficient in mixed fertilizers than when used alone. The efficiency of  $(\text{NH}_4)_2\text{SO}_4$  when applied singly is increased materially when an application of lime has been made to the soil. Explanations are given of the reasons for these results.—*Nellie E. Fealy.*

1976. ANONYMOUS. *The purchase and use of fertilizers.* Jour. Dept. Agric. Union South Africa 8: 594-595. 1924.—Tables are given of the best fertilizer mixtures to use for certain classes of soil and the amount of plant food that should be supplied. If a farmer utilizes compound fertilizers and is undecided as to which of 2 formulae he should buy, it is always more economical to purchase the higher formula. The economics of high analysis fertilizers is discussed with special reference to transportation and handling costs.—*L. I. Goldblatt.*

1977. ATKINS, W. R. G. Notes on the filtration and other errors in the determination of the hydrogen ion concentration of soils. *Sci. Proc. Roy. Dublin Soc.* 17: 341-447. 1924.—For lightly buffered acid soils 1 part of soil to 2 of water is recommended; for other soils a 1 to 5 proportion is desirable. The pH value of some soil extracts is markedly modified by filtration, even when a 1st filtrate is rejected. Both untreated and acid extracted filter-papers may reduce the acidity, but use of a large volume of filtrate lessens error, as does also the use of unextracted filter paper for alkaline and extracted paper for acid soils. The fibres of acid extracted paper appear to be near pH 4.8, those of unextracted near pH 7-7.6. Brom cresol green may be advantageously used instead of methyl red, since it is not removed from solution by organic matter nor is it decolorized irreversibly by bacteria. Clearing by the use of the centrifuge is a satisfactory method.—*Author*.

1978. BUTTNER, E. E. Fruit growing. Manuring. *South African Fruit Grower* 11: 66-68. 1924.—The author deplores the fact that no use is made of human excreta. Most of the human excreta of many towns is allowed to run into rivers, thus upsetting nature's balance. The treatment and the use of manure and sewage, are discussed.—*L. I. Goldblatt*.

1979. CLARKE, G. R. Soil acidity and its relation to the production of nitrate and ammonia in woodland soils. *Oxford Forest. Mem.* 2. 1-27. 1 pl., 3 fig. 1924.—Observations were made of samples taken at intervals from January to November from 6 soil types (whose vegetation is described) near Oxford, England. Investigations were made of: H<sub>2</sub>O content; organic matter; NH<sub>3</sub>, both in the soil and in its water extract; acidity, both as concentration of H-ion and as lime requirement; nitrate; rainfall; and temperature of air and sample.—The nitrate content did not appear to vary greatly from hour to hour. There is a definite relation between the lime requirement of a soil and its content of organic matter. The pH value of a soil growing a forest crop is least acid when the crop is in full growth. The accumulation of NH<sub>3</sub> is greater in very acid soils than it is in slightly acid and neutral soils, the NH<sub>3</sub> of a very acid soil being subject to rapid fluctuation. The water-extractable NH<sub>3</sub> is greater when the soil is dry than when it is moist, apparently because in the drier soil the moisture is insufficient to enable the colloidal material to retain its NH<sub>3</sub>. Nitrate is present in measurable quantities in very acid soils, and is apparently independent of seasonal changes under the conditions of these investigations.—*Ferdinand W. Haasis*.

1980. CUTLER, D. WARD. The action of protozoa on bacteria when inoculated into sterile soil. *Ann. Appl. Biol.* 10: 137-141. 1 fig. 1923.—Data are presented to show that in normal field soil the bacteria and active amoebae show an inverse relationship and that the presence of active protozoa is one of the factors concerned in keeping the number of bacteria below the level they might otherwise have attained.—*J. G. Leach*.

1981. CUTLER, J. VERNELL. Some random notes on the literature relative to the irrigation of orchards. *South African Fruit Grower*. 11: 221-224. Fig. 1-8. 1924.—This is a cursory abstract of the literature on what seems to be from the literary standpoint a rather obscure and indifferently treated subject. It is a condensation of information obtained from reports, and bulletins, with explanatory notes where necessary.—*L. I. Goldblatt*.

1982. ENESCU, I. Experiente cu îngărminte artificiale (Salpetru de Chili, superfostat și săruri potasice) pe domeniile Coroanei. [Experiences with artificial manure (Chili saltpetre, superphosphate, and potassic salts) on the domains of the Crown.] *Bul. Agric. [București]* 4: 112-228. 5 fig. 1922.—The author publishes the result of his experiences on the domains of the Rumanian crown: Sadova, Segarcea, Cocioe, Gherghița, Rușetu, Domnița, Mălini, and Bicaz, in the years 1909-1914. The plants used were wheat, barley, rye, oats, and sugar beet. The general conclusion is that the distribution of the rainfall has a greater effect on the production, than the cultivation of the soil or even the fertilizers applied. For fall crops, if the soil is clay, production is much influenced by the rainfall during the winter. In the sandy-clayey soils this influence is not felt. The spring crops, having a short growth period are much influenced by the lack of precipitation during the winter and at other seasons. To secure the beneficial effect of fertilizers they must be applied at the proper time to get the advantage of the rainfall. They must, of course, be supplied in quantities required by the different plants. Nitrogen in the form of nitrate and P in the form of phosphoric acid were found to be effective, the latter in a lesser measure. Potassic manure has proved in almost all cases



useless, because the soils had sufficient quantities of native K. Experiments with dung combined with artificial fertilizer have given unexpected increases due to the N, but more especially to the organic materials present. The quantity of the manure to be applied must be established by experimentation.—*E. Pop.*

1983. FARMER, J. B. **Leaf mould.** *Nature* 114: 87. 1924.—The formation of leaf mold is promoted by sand or gravel and inhibited by heavy soils, especially if calcareous. The absence of  $\text{CaCO}_3$  to neutralize the products of bacterial action may be a cause of arrest of the bacterial activity with a consequent accumulation of mold.—*O. A. Stevens.*

1984. JACOB, K. D., F. E. ALLISON, AND J. M. BRAHAM. **Chemical and biological studies with cyanamid and some of its transformation products.** *Jour. Agric. Res.* 28: 37-69. 12 fig. 1924.—Laboratory investigations on the factors affecting the ammonification and nitrification of commercial calcium cyanamide, and C. P. urea, dicyanodiamide, guanylurea sulphate, guanidine nitrate, guanidine carbonate and biguanide nitrate were carried out using a productive Susquehanna loam soil. Calcium cyanamide was rapidly converted into its decomposition products which were chiefly urea and  $\text{NH}_3$ , within 5 to 10 days, or less, depending upon the quantity of calcium cyanamide used. Nitrification of calcium cyanamide, in general proceeded more slowly than that of urea and  $(\text{NH}_4)_2\text{SO}_4$ , and the larger the application of calcium cyanamide the slower was the process. After the initial retarding period of 2-4 weeks, nitrification of calcium cyanamide proceeded at nearly the normal rates for urea and  $(\text{NH}_4)_2\text{SO}_4$  except where very large quantities were used, in which cases there was evidence of the formation of decomposition products other than urea and  $\text{NH}_3$ , probably dicyanodiamide and guanylurea. Contrary to results obtained with urea and  $(\text{NH}_4)_2\text{SO}_4$ , addition of  $\text{CaCO}_3$  to the soil retarded the nitrification of calcium cyanamide, which was probably due to an increase in the amount of dicyanodiamide formed. Maximum accumulation of nitrates from calcium cyanamide was obtained in soil containing 30% moisture, corresponding to about  $\frac{3}{4}$  saturation. The highest rate of nitrification of calcium cyanamide and the lowest for urea were obtained in the presence of 10% moisture. With both calcium cyanamide and urea, nitrate formation was negligible in the presence of 40% moisture. Nitrate formation from calcium cyanamide was more rapid and complete at  $38.5^\circ\text{C}$ . than at lower temperatures. Urea nitrified at all temperatures from 0 to  $38.5^\circ$ , the rate rapidly increasing up to  $30^\circ$  but decreasing at  $38.5^\circ$ . Partial sterilization of the soil with phenol practically stopped all nitrification of calcium cyanamide. Dicyanodiamide was slowly decomposed in the soil, the N accumulating as  $\text{NH}_3$ ; and with 12.72 mg. of N as dicyanodiamide per 250 g. of soil, nitrification of the added N was delayed for 36 weeks. In all cases, dicyanodiamide markedly retarded nitrification of the organic soil N. As little as 0.1 mg. of dicyanodiamide in 100 g. of soil greatly delayed nitrification of  $(\text{NH}_4)_2\text{SO}_4$  and with 10.5 mg. nitrification was prevented for 210 days. The rate of ammonification of urea was not appreciably affected by concentrations of dicyanodiamide as high as 315.2 mg. per 250 g. of soil. Guanylurea sulphate decomposed to  $\text{NH}_3$  very slowly and the  $\text{NH}_3$  so formed did not accumulate but was converted into nitrates. Guanylurea sulphate did not affect ammonification of urea but did delay nitrification for several weeks, the injurious effect being much less than in the case of dicyanodiamide. Guanidine nitrate and guanidine carbonate depressed nitrification of soil organic matter for several weeks, the period depending upon the amount of salts applied. After the initial depression period, nitrates were formed quite rapidly and in one instance 91% of the guanidine N was nitrified after 75 days. Biguanide nitrate behaved practically as an inert material. A bibliography of 27 references to the literature is appended.—*K. D. Jacob.*

1985. KNIBBS, N. V. S. **The use of lime in agriculture.** *Jour. Bd. Agric. British Guiana* 16: 79-84. 1923.—This paper is a brief discussion of the relation of lime to soil fertility.—*J. P. Jones.*

1986. MCCALL, A. G., AND C. P. WILHELM. **The effect of heat upon the availability of the phosphorous in basic phosphate rock.** *Maryland Agric. Exp. Sta. Bull.* 260. 103-120. 1923.—There are in the U. S. A. large deposits of low-grade phosphate rock which are not now being mined but which will eventually become valuable when the high grade deposits approach exhaustion, or when a cheaper method than the acidulation process is devised for rendering the P in low-grade rock available for use by plants. Three samples of Tennessee phosphate

limestone were subjected to burning at 950°C. for 12 hours. It was found that the citrate solubility of the P was slightly increased, but results obtained in pot and field tests showed that the availability to plants of the P in these calcined materials was not high. The pulverized raw untreated phosphate rock gave better results than 10 times the quantity of calcined phosphate when used alone as a source of P or with acid phosphate in complete fertilizers, in tests with wheat and with soy beans. Hence it is concluded that the commercial value of the calcined phosphate for agricultural purposes cannot be great.—*J. T. Rosa.*

1987. NASIR, S. M. Some preliminary investigations on the relationship of protozoa to soil fertility with special reference to nitrogen fixation. *Ann. Appl. Biol.* 10: 122-133. 1 fig. 1923.—Data are presented to show that the presence of protozoa has no depressing effect on the N-fixing bacteria either in artificial culture or in sand cultures.—*J. G. Leach.*

1988. NOLTE, O. Zeit und Streitfragen der Kalkdüngung. [Current and debatable questions in regard to liming.] *Mitteil. Deutsch. Landw. Ges.* 39: 590-593, 614-618. 1924.—This is a general review of the function of lime, the crops that require the most lime and the relation between liming and the use of acid fertilizers.—*A. J. Pieters.*

1989. OLARU, A. D. Ingrășăminte chimice în agricultură. [Chemical fertilizers in soil management.] *Viața Agric. [București]* 13: 103-110. 1922.—The author describes various experiments to determine the value of Mn as a fertilizer.—*Al. Borza.*

1990. OLARU, A. D. Observațiuni asupra întrebuințării îngrășămintelor. [Remarks concerning the use of manures.] *Viața Agric. [București]* 13: 68-71. 1922.—The important role of Mn as a fertilizer can not be determined according to the experiments of Dobrescu.—*Al. Borza.*

1991. PINCKNEY, R. M. Effect of nitrate applications upon the hydrocyanic-acid content of sorghum. *Jour. Agric. Res.* 27: 717-723. 1924.—The hydrocyanic acid in green sorghum plants grown in soils low in N was found to be in proportion to the  $\text{NaNO}_3$  applied to the soil. The effect on the hydrocyanic acid content continued even beyond the point where the  $\text{NaNO}_3$  ceased to affect the color and size of the plants. In light colored sorghum plants, the percentage of hydrocyanic acid was much lower than in the colored plants. Leaves of the dark colored plants contained several times as high a percentage of hydrocyanic acid as stems. It is suggested that sorghum may prove useful as an indicator-plant in studying the supply of available N in the soil.—*Author.*

1992. PINCKNEY, R. M. Sorghum as an indicator of available soil-nitrogen. *Soil Science* 17: 315-321. 1924.—Sorghum plants grown on fertile soils were analyzed for hydrocyanic acid at periods 17, 55, and 88 days after seeding. In every case the younger plants were higher in percentage of hydrocyanic acid than the older ones. Added nitrate increased the hydrocyanic acid content at all stages of growth of the plants. In sorghum grown under average farm conditions, 0.087-2.59 mg. of hydrocyanic acid per plant was found, the amount varying from 0.00017 to 0.0036% of the green weight of the plant. On fertilized plots, the amounts were in some cases much greater.—*Author.*

1993. RUSSELL, E. JOHN, and members of the biological staff of the Rothamsted Experimental Station. The micro-organisms of the soil. vii + 188 p. 24 fig., 16 tab., *diagr.* Longmans, Green & Co.: London & New York, 1923.—“The purpose of this volume is to give the broad outlines of our present knowledge of the relationships of the population of living organisms in the soil to one another and to the surface vegetation. . . . Each group of organisms is here dealt with by the person primarily responsible for that particular section of the work [at Rothamsted].”—Titles of the 10 chapters, with their respective authors in parenthesis, follow: Development of the idea of a soil population (E. JOHN RUSSELL); occurrence of bacteria in the soil—activities connected with the acquirement of energy; and conditions affecting bacterial activities in the soil—activities connected with the intake of protein building materials (H. G. THORNTON); protozoa of the soil, I, II (D. W. CUTLER); soil algae (B. MURIEL BRISTOL); soil fungi—the occurrence of fungi in the soil; and the life of fungi in the soil (W. B. BRIERLEY); the invertebrate fauna of the soil (other than protozoa) (A. D. IMMS); and the chemical activities of the soil population and their relation to the growing plant (E. JOHN RUSSELL).—*Fredrick V. Rand.*

1994. SCOFIELD, CARL S. The movement of water in irrigated soils. *Jour. Agric. Res.*



27: 617-693. 2 pl., 13 fig. 1924.—The simple quantitative relations between the soil and the soil solution are briefly reviewed and factors influencing the permeability of soil to the movement of  $H_2O$  are discussed. The point most emphasized is that chemical reactions are continually going on between electrolytes in the soil solution and certain acid complexes of the soil. The results of these reactions influence profoundly the physical condition of the soil. When conditions are such that the soil solution becomes enriched with Na, the reaction is in the direction of combining Na with the acid complex of the soil and the replacement from combination of an equivalent quantity of Ca which passes into solution. This reaction appears to be completely reversible, so that the soil and its solution are normally in equilibrium with respect to the basic ions. The combination of Na with the soil results in deflocculation or "puddling," while Ca in such combination makes for flocculation or friability. The injurious effects of  $Na_2CO_3$  or "black alkali" on the physical condition of the soil appear to be due to the Na rather than to the carbonate. Sodium in solution, even when associated with the stronger acids, combines with the soil and ultimately causes deflocculation and impermeability.—*Author*.

1995. SCOTT, WINFIELD. The losses of calcium from the Newton experimental fluid. *Proc. Iowa Acad. Sci.* 30: 245-253. 1923.—The loss of Ca from a field in Illinois treated with limestone and with dolomite, has been about proportional to the amount applied. It seems that it would pay to add larger amounts at longer intervals rather than smaller amounts at shorter intervals.—*H. S. Conard*.

1996. "SORDOUGH." About feed crops and how to grow them. *South African Fruit Grower* 11: 181-183. Fig. 1-6. 1924.—South Africa carries more dry lands than irrigated, and it is the belief of the author that the future of South Africa is based on her dry lands if these are scientifically worked. The working of the soil is discussed and "moisture fallow" or conservation of "soil" water is described.—*L. I. Goldblatt*.

1997. WILLIS, L. G. Nitrification and acidity in the muck soils of North Carolina. *North Carolina Agric. Exp. Sta. Tech. Bull.* 24. 3-13. 1923.—The muck soils of eastern North Carolina are acid but do not derive the full benefit from liming, probably on account of the presence of soluble salts of Fe. The high organic N content of these soils constitutes a reserve of potential acidity which is impossible of measurement in terms of lime requirement. The yield of corn on such soils may be increased by the application of potash salts and of  $NaNO_3$ . Acid phosphate, however, depresses yields, probably by stimulating the activity of the acid-producing organisms in these muck soils.—*F. A. Woff*.

## TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 1072, 1096, 1135, 1136, 1141, 1147, 1149, 1169, 1171, 1211, 1214, 1240, 1257, 1260, 1262, 1266, 1267, 1268, 1269, 1270, 1272, 1274, 1275, 1284, 1340, 1354, 1368, 1520, 1532, 1539, 1550, 1551, 1552, 1689, 1951)

### GENERAL

1998. FOURNIER, P. Pour la nomenclature ternaire. [Ternary nomenclature.] *Bull. Soc. Bot. France* 71: 151-153. 1924.—The advantages of ternary nomenclature are presented.—*P. A. Young*.

1999. JEPSON, WILLIS LINN. A flora of the economic plants of California for agricultural students, including the important crop plants, agricultural weeds, poisonous plants, honey plants, medicinal plants, chaparral shrubs, native timber trees, and the most common native plants of the spring flowering. Small 8vo. 223 p. 16 fig. Associated Students Store: Berkeley, California. 1924.—This flora makes no pretense to completeness, but the author includes the more important natural families of flowering plants in order to familiarize the student with the essential characters of these families and to develop an interest in their relationships. A short chapter on the development of ideas in classification and one on the life history of a flowering plant in the light of its race history precede a synopsis of the families and plant de-

scriptions. A dichotomous key to the genera is given under each family; and under each genus, consisting of 2 or more species, a key is also added for the ready determination of the species.—*J. M. Greenman.*

2000. Кузнецов, Н. И. [KUZNETSOV, N. I.] **Количество видов растений на земном шаре.** [The number of plant species.] Известия главного ботанического сада Р. С. ф. С. Р. [Bull. Princip. Jard. Bot. Republique Russe] 21: 92-108. (Reprint 1-17.) 1922.—The author determines the approximate number of species to be 273,000-274,000. This number is less than that of Wiesner (360,000-720,000) but more than the number which is given by Vines (176,000). The data are taken from Wiesner's work "Biologie der Pflanzen", 1889; and those of Vines from the book by Scott, "The evolution of plants" (1912), but not from Vines' work (See: British Assoc. Report. 1900 [Brandford]). The data for the Angiospermae are taken from Engler's Syllabus der Pflanzenfamilien, 7th edition (1912) and from the Index Kewensis, exclusive of Suppl. V, 1911-1915 (1921).—*V. Lashevsky.*

#### PTERIDOPHYTES

2001. CONARD, H. S. **A manual of the ferns and "fern-allies" of Grinnell and vicinity.** Proc. Iowa Acad. Sci. 29: 317-327. 1922 [Jan. 19, 1924].—This is a descriptive key, with habitat, locality and distribution; 24 species are included.—*H. S. Conard.*

#### SPERMATOPHYTES

2002. АЛЕХИН, В. [ALECHIN, V.] **Alchimilla semilunaris n. sp.** Ботанические Материалы Гербария Главного Ботанического Сада Р. С. ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 132. 1922.—The habitat for this new species is given as "prov. Mosquensi distr. Zvenigorod pag. Golitzyno."—*J. M. Greenman.*

2003. БАЗИЛЕВСКАЯ, Н. [BASILEVSKAJA, N.] **Критическая заметка о секциях Laguroopsis и Sphaerocystis рода Astragalus подрода Calycocystis.** [A critical remark on both sections Laguroopsis and Sphaerocystis of the genus Astragalus subgenus Calycocystis.] Ботанические Материалы Гербария Главного Ботанического Сада Р. С. ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 105-120. 1922.—The author gives a revision of all the 20 species belonging to sections *Laguroopsis* and *Sphaerocystis* of Bunge, and unites both sections under the name of *Laguroopsis* (emend.), gives an analytical key to the species, and enumerates all known localities. Five species are described as new: *Astragalus Neo-Fedtschenkoanus*, *A. violaceus*, *A. schachimardanus*, *A. inaequalifolius*, *A. spinulosus* and the following new varieties, *A. ellipsoideus* Led. var. *kuldshensis*, *A. arkalycensis* Bge. var. *violaceus*, and *A. megalomerus* Bge. var. *longeracemosa*.—*Boris Fedtschenko.*

2004. BATHIE, H. PERRIER DE LA. **Un nouveau genre de Dioscoréacées.** [A new genus of the Dioscoreaceae.] Bull. Soc. Bot. France 71: 25-27. Pl. 1. 1924.—The author describes *Avetra sempervirens* n. gen. and n. sp. from Madagascar.—*P. A. Young.*

2005. BOIS, D. **Sur quelques formes de Cucurbita maxima.** [Some forms of *C. maxima*.] Bull. Soc. Bot. France 71: 91-93.

2006. BORNMÜLLER, J. **Einiges über Poa hybrida Gaud. und Poa Chaixii Vill.** [Poa hybrida and Poa Chaixii.] Repert. Spec. Nov. Regni Veg. 16: 301-304. 1919 (Repert. Eur. et Med. 1: 397-400. 1919).—Latin descriptions and critical notes are given of *Poa hybrida* Gaud. var. *Vallesiaca* n. var. from Zermatt, Switzerland, and *Poa Chaixii* Vill. β *virginica* Asch. & Graebn. subvar. *aurata* n. subvar. from Hesse-Nassau, Prussia.—*John E. Dinsmore.*

2007. BORNMÜLLER, J. **Zur Gattung Moehringia.** [The genus Moehringia.] Repert. Spec. Nov. Regni Veg. 16: 183-186. 1919 (Repert. Eur. et Med. 1: 343-346. 1919).—The distinguishing characteristics of several species are given including a Latin description of *Moehringia minutiflora* n. sp. from Markograd in central Macedonia.—*John E. Dinsmore.*

2008. CAYZER, A., AND F. W. WAKEFIELD. **Darwinia pimelioides, n. sp.** Jour. and Proc. Roy. Soc. Western Australia 8: 40-41. Fig. 1-3. 1922.—The relationships of this shrub from Western Australia are not given.—*Wm. Randolph Taylor.*

2009. CHEEL, E. **On a new species of Daviesia from Western Australia.** Jour. and Proc. Roy. Soc. Western Australia 6: 35-36. 1920.—The species described here, *D. costata*, is most nearly related to *D. Wyattiana* Bailey.—*Wm. Randolph Taylor.*



2010. Черняковская, Е. [CZERNIAKOWSKA, E.] *Fragmenta florae Transcaspicæ. II. De generis Ophrydis specie nova ex Turkestan.* [Notes on the Transcasian flora. II. A new species of the genus *Ophrys* from Turkestan.] Ботанические Материалы Гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 4: 1-4. 1923.—*Ophrys transhyrcana* is described as new and critical notes on other species and varieties of this genus are given.—B. Kozot-Poljanski.

2011. DIOGO, J. CESAR. *Especies novas do herbario da Secção de Botanica do Museu Nacional do Rio de Janeiro.* [New species in the herbarium of the Rio de Janeiro Museum.] Bol. Mus. Nacion. Rio de Janeiro 1: 27-30. 1923.—*Paepalanthus Allemanii*, *Syngonanthus breviramis*, *Erythroxylum cearense*, and *E. Lofgrenii* are described as new.—Edith K. Cash.

2012. Федченко, Б. А. [FEDCHENKO, B. A.] *De Plumbaginacearum nonnularum phylogenesi.* [The phylogenesis of some Plumbaginaceae.] Ботанические Материалы Гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 1-3. 1 map. 1922.—The author describes a new genus, *Chomutowia*, of the Plumbaginaceae, a remarkable plant from central Asia, and gives an account of its phylogenetic relationship. It is related to *Acantholimon Bunge* from the Orient to western Tibet and Dsungaria and to *Aegialitis* R. Br. of the Monsun region. Only 1 species is known, namely *C. Ekatherinae* from the mountains of Tian-Schan in Turkestan.—Boris Fedchenko.

2013. Федченко, Б. А. [FEDCHENKO, B. A.] *Notes sur plantes nouvelles ou rares.* 7-8. [Notes on new or rare plants. 7-8.] Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. République Russe] 18<sup>1</sup>: 13-15. 1 fig. 1918.—Two new species are described, namely, *Zygophyllum bucharicum* from Bucharâ and *Allium Margaritae* from Turkestan.—J. M. Greenman.

2014. FEDDE, FRIEDRICH. *Beiträge zur Kenntnis der europäischen Arten der Gattung Corydalis. I.* [European species of *Corydalis*. I.] Repert. Spec. Nov. Regni Veg. 16: 49-60. 1919 (Repert. Eur. et Med. 1: 321-332. 1919).—The history and relationship of the following species of *Corydalis* are given at some length: *C. solida* Sw., *C. intermedia* Mérat, *C. fabacea* Pers., *C. pumila* Reichb., *C. rutacea* Th. M. Fries, *C. Neumanii* n. name (*C. intermedia* × *pumila* Neuman), *C. Samuelssonii* n. name (*C. intermedia* × *laza* Samuelsson).—John E. Dinsmore.

2015. FEDDE, FRIEDRICH. *Beiträge zur Kenntnis der europäischen Arten der Gattung Corydalis. II.* [European species of *Corydalis*. II.] Repert. Spec. Nov. Regni Veg. 16: 187-192. 1919 (Repert. Eur. et Med. 1: 347-352. 1919).—The following variety and species are discussed at length: *Corydalis solida* var. *australis* Hausmann; *C. densiflora* Presl; *C. slivenensis*, *C. bicalcara*, and *C. balcanica* Delenowsky; and *C. campylochila* (*C. intermedia* × *solida*) Teyber.—John E. Dinsmore.

2016. GAGNEPAIN, F. *Euphorbiacées nouvelles (Alchornea, Daphniphyllum et Deutzianthus, g.n.).* [Alchornea, Daphniphyllum; and Deutzianthus, new genus.] Bull. Soc. Bot. France 71: 137-141. 1924.—The author describes the following new species from Indo-China: *Alchornea annamica*, *A. Coudercii*, and *Daphniphyllum cambodianum*. *Deutzianthus* is proposed as a new genus of the Euphorbiaceae and is represented by 1 species, *D. tonkinensis*, from Tonkin.—P. A. Young.

2017. GAGNEPAIN, F. *Euphorbiacées nouvelles (Drypetes).* [New Euphorbiaceae (Drypetes).] Bull. Soc. Bot. France 71: 257-262. 1924.—The following new species from Indo-China are described: *Drypetes bisacuta*, *D. cambodica*, *D. Hermandii* Pierre, *D. hoensis*, *D. perreticulata*, *D. Poilanei*, *D. salicifolia*, *D. subsessilis*, and *D. Thorelii*.—P. A. Young.

2018. GAGNEPAIN, F. *Poilania, g.n. Compositaeum.* [Poilania, new genus of the Compositae.] Bull. Soc. Bot. France 71: 56-57. 1924.—The author describes *Poilania laggeroides* n. gen. and sp. from Annam, Indo-China.—P. A. Young.

2019. GARDNER, C. A. *Contributions to the flora of Western Australia, No. 1.* Jour. and Proc. Roy. Soc. Western Australia 9: 34-36. 1923.—*Grevillea yorkkrakensis*, *G. cordata* of the section *Anadenia*, *Kunzea sericea* Turcz. var. *glabra*, and *Ionidium epacroides* are described as new.—Wm. Randolph Taylor.

2020. GARDNER, C. A. *Contributions to the flora of Western Australia, No. 2.* Jour. and Proc. Roy. Soc. Western Australia 9: 37-43. 1923.—*Casuarina microstrobilus*, *C. spinosissima*,

*Adenanthos intricata*, *Grevillea arida*, *Acacia Pelloiae*, *Pommaderis Mayeri*, *Darwinia collina*, *Ericopsis* n. gen. of the Ericaceae, near *Wittsteinia*, and *E. formosus* are described as new. This is the 1st record of a member of the Ericaceae in Western Australia. An amplified description is also given of *Casuarina Helmsii* Ewart & Gordon.—Wm. Randolph Taylor.

2021. GARDNER, C. A. Contributions to the flora of Western Australia, No. 3. Jour. and Proc. Roy. Soc. Western Australia 9: 90–105. Pl. 2. 1923.—This paper consists of miscellaneous notes on various species, including especially the following: *Hakea eriantha* R. Br., a new record for Western Australia. *Hannafordia Kesseli* n. sp., near *H. Bissillii* F. v. M.; *Hypocalymma punicea* n. sp., near *H. longifolium* F. Muell. and *H. scariosum* Schau.; *Melaleuca arenaria* n. sp., near *M. polycephala* Benth., are described.—Wm. Randolph Taylor.

2022. GINZBERGER, AUGUST. Über einige Centaurea-Arten der adriatischen Küsten und Inseln. II. Zur Kenntnis der Systematik und geographischen Verbreitung des Formenkreises von *Centaurea Friderici* Vis. und *Centaurea crithmifolia* Vis. [Some species of *Centaurea* of the Adriatic coasts and islands. II. The classification and geographical distribution of the group of forms represented by *Centaurea Friderici* Vis. and *C. crithmifolia* Vis.] Oesterreich. Bot. Zeitschr. 70: 29–46. 6 fig. 1921.—These 2 species are not closely related to other members of the genus and are found only on 2 islands in the Adriatic Sea; Pomo and Pelagosa piccola. A new species, *Centaurea jabukensis* Ginzberger & Teyber, is described, based on the material from Pomo which has been referred previously to *C. Friderici*. *C. pomoënsis* Teyber is a hybrid between this and *C. crithmifolia* Vis. The differences between these 4 forms are pointed out in detail. *C. Friderici* is not common on Pelagosa. The other 3 forms are confined to Pomo where they are abundant.—T. D. Howe.

2023. GRAEBNER, [P.], ET [P.] GRAEBNER, JR. *Glechoma Hindenburgiana*. Repert. Spec. Nov. Regni Veg. 16: 61. 1919 (Repert. Eur. et Med. 1: 333. 1919).—*Glechoma Hindenburgiana* is described as a new species from Lithuania.—John E. Dinsmore.

2024. GUILLAUMIN, A. Observations sur les *Symplocos* d' Extrême-Orient, particulièrement d'Indo-Chine. [Observations on the *Symplocos* species of the extreme orient, especially Indo-China.] Bull. Soc. Bot. France 71: 273–288. 1924.—The author describes the following new species: *Symplocos angustifolia*, *S. elephantis*, *S. garcinifolia*, *S. graveolens*, *S. Hermandii*, *S. Poilanei*, and *S. touranensis*. A key is given to the *Symplocos* species of Indo-China. New names included are: *Barringtonia multiflora* (*Symplocos multiflora* Eberh. & Dub., *B. Eberhardtii* Gagnep.) and *Eriobotrya Seguini* (*Symplocos Seguini* Lev., *E. pseudo-Raphiolepis* Cardot).—P. A. Young.

2025. HAMET, RAYMOND. Sur un *Sedum* de l'herbier du jardin botanique Saint Pétersbourg. [A *Sedum* from the herbarium of the St. Petersburg Botanical Garden.] Bull. Soc. Bot. France 71: 154–157. Pl. 2. 1924.—The author describes *Sedum Perroti* n. sp., a native of the Province of Kansu, China.—P. A. Young.

2026. HAYEK, AUGUST. Diagnosen neuer von J. Dörfler und H. Zerny in den Jahren 1916 und 1918 in Albanien gesammelter Pflanzenformen. [Diagnoses of new plants collected by J. Dörfler and H. Zerny in Albania during the years 1916 and 1918.] Oesterreich. Bot. Zeitschr. 70: 12–22. 1921.—The following new species, subspecies, varieties, and forms are described: *Minuartia Dörfleri*, *Dianthus Carthusianorum* L. var. *brachyanthus* Dörf. & Hay., *D. leucophoeniceus* Dörf. & Hay., *D. silvester* Wulf. var. *brevicalyx* Will. f. *transiens*, *Lychnis Flos-cuculi* L. subsp. *subintegra*, *Polygala vulgaris* L. subsp. *illyrica*, *Potentilla ternata* C. Koch var. *pseudoaurea*, *Rosa mollis* Sm. var. *Dörfleri*, *R. mollis* Sm. var. *abatensis*, *Medicago prostrata* Jacq. var. *pseudorupestris*, *Trifolium Wettsteinii* Dörf. & Hay., *T. ochroleucum* Huds. var. *Zernyi*, *Carum Lumepeanum* Dörf. & Hay., *Laserpitium Zernyi*, *Euphrasia pectinata* Ten. subsp. *albanica*, *Stachys Dörfleri*, *Galium lucidum* All. var. *dinaricum*, *Cephalaria pastricensis* Dörf. & Hay., *Campanula scheuchzeriformis*, *Asyneuma comosiforme* Hay. & Janch., *Achillea atrata* L. subsp. *carvifolia* Dörf. & Hay., *Achillea Dörfleri*, *Cirsium canum* (L.) All. var. *subtymphaeum*, *Hypochoeris maculata* L. var. *koritnicensis* Dörf. & Hay., *Sesleria gigantea* Dörf. & Hay., *Allium flavum* L. var. *albanicum*. Hayek is the author of the several combinations indicated otherwise indicated.—T. D. Howe.

2027. HEIMERL, A. *Artemisia absinthium* × *laxa*. Oesterreich. Bot. Zeitschr. 73: 213–218. 1 fig. 1924.—This is a description of a new hybrid.—Ernst Artschwager.



2028. HERBERT, D. A. Confusion between *Acacia cyanophylla*, *A. saligna*, and *A. cyclops*. Jour. and Proc. Roy. Soc. Western Australia 6: 71-74. 1 pl. 1920.—*Acacia cyclops* belongs to the *Plurinerves*, the others to the *Uninerves*. *A. cyanophylla* Lindl. has the calyx half or more than half as long as the corolla and petals with midrib, while *A. saligna* has the calyx not half as long as the corolla and the petals without midrib, in addition to other differences.—Wm. Randolph Taylor.

2029. HERBERT, D. A. Contributions to the flora of Western Australia, No. 1. Jour. and Proc. Roy. Soc. Western Australia 6: 105-107. 1920.—*Isopogon occidentalis*, near *I. divergens* R. Br., is described as new. The chemical changes in the pigment of the corollas is discussed in its systematic and chemical relations. *Boronia tenuis* Benth. (Rutaceae), *Xylostroma gigantea* Fries (Polyporaceae), and *Lysurus Gardneri* Berkeley (Phalloideae) are discussed.—Wm. Randolph Taylor.

2030. HERBERT, D. A. Contributions to the flora of Western Australia, No. 2. Jour. and Proc. Roy. Soc. Western Australia 7: 69-70. 1921.—*Conospermum suaveolente* n. sp., near *C. amoenum* Meissn., is described and notes are given on other species.—Wm. Randolph Taylor.

2031. HERBERT, D. A. Contributions to the flora of Western Australia, No. 3. Jour. and Proc. Roy. Soc. Western Australia 7: 87-89. 1921.—*Casuarina horrida*, near *C. thuyoides* Mig. and *C. bicuspidata* Benth., *Thryptomene fimbriata*, near *T. australis* Endl., and *Persoonia angustifolia* Benth. var. *burracoppinensis* are described as new and general remarks are given on other species.—Wm. Randolph Taylor.

2032. HERBERT, D. A. Contributions to the flora of Western Australia, No. 4. Jour. and Proc. Roy. Soc. Western Australia 8: 35-40. 1922.—*Darwinia thryptomenioides*, *Melaleuca coronicarpa*, *Pullenaea astipulea*, *Jacksonia hemisericca*, *Microcybe pauciflora* Turcz. var. *uniflora*, *Daviesia uniflora*, and *Logania tortuosa* are described as new and their relationships indicated. *Simsia latifolia* R. Br. is discussed and *S. latifolia* var. *gracilis* Ostf. and *Stirlingia latifolia* Steud. are reduced to synonymy under that species. *Gasterolobium spinosum* Benth. is discussed and the following forms of this species are indicated: f. *typicum*, f. *angustum* (including var. *angustum* E. Pritzl), f. *parvifolium* (including vars. *inermis* and *microphyllum* S. Moore), and f. *crassifolium*; vars. *triangulare* Benth. and *trilobum* S. Moore are retained.—Wm. Randolph Taylor.

2033. HERBERT, D. A. The genus *Xanthorrhoea* in Western Australia. Jour. and Proc. Roy. Soc. Western Australia 7: 79-84. Pl. 18. 1921.—This contains a general discussion of the species and of the oils and resins to be derived from them. *Xanthorrhoea brevistyla*, near *X. Preissii* Endl., and *X. nana* are described as new.—Wm. Randolph Taylor.

2034. HERBERT, D. A. *Xanthorrhoea reflexa*: a new species of Blackboy. Jour. and Proc. Roy. Soc. Western Australia 6: 33-34. 1920.—*Xanthorrhoea reflexa* is related nearly to *X. Preissii* Endl.—Wm. Randolph Taylor.

2035. ИЛЬИН, М. М. [IL'IN, M. M.] Notes sur quelques espèces de la famille Malvacées. 1. *Lavatera cashemiriana* Camb. [Notes on some species of the family Malvaceae. 1. *Lavatera cashemiriana* Camb. Известия Главного Ботанического Сада Р. С. ф. С. Р. [Bull. Princip. Jard. Bot. République Russe] 18<sup>1</sup>: 15-18. 1918.—The author concludes that *Lavatera cashemiriana* Camb. is conspecific with *L. thuringiaca* L., or that it presents at most an oriental race of this species.—J. M. Greenman.

2036. ИЛЬИН, М. М. [IL'IN, M. M.] Notes sur quelques espèces de la famille des Malvacées. [Notes on some species of the family Malvaceae.] Известия Главного Ботанического Сада Р. С. ф. С. Р. [Bull. Princip. Jard. Bot. République Russe] 18<sup>2</sup>: 45-49. 1918.—The author shows that *Lavatera biennis* M. B. is only a synonym of *L. punctata* All. He also notes that *Althaea Ludwigii* L., found in the Bucharra, is the 1st occurrence of this species in central Asia.—J. M. Greenman.

2037. ИЛЬИН, М. М. [IL'IN, M. M.] *Olgaea* genus novum ex Asia centrali. [Olgaea, a new genus from central Asia.] Ботанические Материалы Гербария Главного Ботанического Сада Р. С. ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 141-146. 1922.—The author establishes the new genus, *Olgaea*, of the Compositae, allied to *Carduus* and *Jurinea*, and gives an enumeration of 11 species belonging thereto, as follows: Section 1. *Apteron*: *Olgaea baldshuanica* (*Carduus baldshuanica* C. Winkl.), *O. eriocephala* (*C. eriocephala*

*lus* C. Winkl.), *O. longifolia* (*C. longifolius* C. Winkl.), *O. nivea* (*C. niveus* C. Winkl.), *O. Thomsoni* (*C. Thomsoni* Hook. f.), *O. Roborowskyi*, *O. lancipes* (*C. lancipes* C. Winkl.), *O. nidulans* (*C. nidulans* Rupr.); Section 2. *Pterocaulon*: *O. Lomonossowii* (*C. Lomonossowii* Trautw.), *O. tangutica*, *O. leucophylla* (*C. leucophyllus* Turcz.) and var. *jucunda*. The new genus is dedicated to the lately deceased Mrs. Olga Fedtschenko, a well known explorer of the flora of central Asia.—*Boris Fedchenko*.

2038. ISING, E. H. A new South Australian Eucalyptus (E. Isingiana J. H. Maiden). South Australian Nat. 4: 109. 1 pl. 1923.

2039. КОЗО-ПОЛЯНСКИЙ, В. М. [KOZO-POLJANSKI, V. M.] Гербарные заметки. I. [Herbarium studies. I.] Ботанические материалы гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 4: 69-73. 1923.—This study records the results of a critical examination of authentic specimens of *Chaerophyllum aromaticum* L. and its immediate allies of the Caucasus region. The following conclusions are deduced: *Chaerophyllum angelicaefolium* M. B. (1819, excl. syn. Tourn.) must be reestablished, and *C. orthostylum* Trautv. (1875) and *C. silvicola* Lipsky (1898) are conspecific with it; *C. angelicaefolium* C. A. Mey., not M. B., is a synonym of *C. Meyeri* Boiss. & Bushe; *Anthriscus Schmalhauseni* K.-Pol. (1915) is recognized and to it are referred as synonyms *Chaerophyllum Schmalhauseni* Alboff (1894), *C. angelicaefolium* Trautv., not M. B., not C. A. Mey., *C. aromaticum* Alboff, not L., *C. orthostylum* Akinfiew, not Trautv., and *Aegopodium podagraria* Alboff Pl. exs. n. 268, not L. The diagnostic characters are contrasted and the geographical distribution is discussed. Thus *Chaerophyllum aromaticum* collect. of the Caucasian flora consists of 3 distinct species, namely, *C. angelicaefolium* M. B., *C. Meyeri* B. & B., and *Anthriscus Schmalhauseni* K.-Pol.—*Author*.

2040. КРАШЕНИННИКОВ, И. М. [KRASCHENINNIKOV, I. M.] Compositae austro-americanae novae. I. [New Compositae from South America I.] Ботанические материалы Гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 157-162. 1922.—The author reviews the Compositae in the large Herbarium of the Petrograd Botanical Garden. The large collections of Riedel, Lund, and Lusch-nath from Brazil (1813-1836) contain many undescribed species from which in the present paper the following are described, as new species: *Piptocarpha Luschnathii*, *Stilpnopappus bullatus*, *S. Sellowianus*, *Lychnophora saxosa*, *Elephantopus arenosus* and *Alomia glutinosa*.—*Boris Fedchenko*.

2041. КРАШЕНИННИКОВ, И. М. [KRASCHENINNIKOV, I. M.] Compositae austro-americanae novae. II. [New Compositae of South America. II.] Ботанические материалы Гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 4: 49-54. 1923.—The present article contains descriptions of the following new species, all of which are based on the Brazilian collections of Riedel: *Stenachaenium adenantum* (*Dichropappus adenantus* Sch. Bip. in Sched.), *Calea Bipontinii* (*C. rotundifolia* Sch. Bip. in Sched., not Baker), *C. multijuga* (*C. uniflora* Sch. Bip. in Sched., not Less.), *C. camporum* (*C. Riedelii* Sch. Bip. in Sched., in part), *C. catalaonensis*, *C. glabrata* Sch. Bip., *C. coronopifolia* Sch. Bip., *C. graminifolia* Sch. Bip., and *C. tridactylita* Sch. Bip.—*B. Kozo-Poljanski*.

2042. ЛИТВИНОВ, Д. [LITWINOW, D.] *Betula divaricata* Led. Ботанические материалы Гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 193-198. (Reprint p. 1-6.) 1922.—The author finds no difference between *Betula divaricata* Led. (1841) and *B. Middendorffii* Tr. & Mey. (1856).—*V. Lashevsky*.

2043. НОВОПОКРОВСКИЙ, И. В. [NOVOPOKROVSKY, I. V.] Notes systématiques sur les Astérées.—II. Nouveau genre *Pseudolinosyris* Novoporovsky. [Systematic notes on the Astereae.—II. A new genus *Pseudolinosyris*.] Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. République Russe] 18: 7-13. 1918.—*Pseudolinosyris* is proposed as a new genus of the Compositae, and the following species and varieties from the mountains of central Turkestan are included: *P. Grimmi* (*Linosyris Grimmi* Rgl. & Schmalh.) and var. *glandulosa*, *P. Capusi* (*Lynosyris Capusi* Franchet) vars. *eglandulosa* and *microcephala*.—*J. M. Greenman*.

2044. PELLEGRIN, FRANÇOIS. Augouardia Pellegrin, genre nouveau de Césalpiniées du



Congo. [Augouardia Pellegrin, a new genus of the Cesalpinieae from Congo.] Bull. Soc. Bot. France 71: 309-311. 1924.—The author describes Augouardia as a new genus and *A. LeTestui* n. sp., comparing it with *Talbotiella* Baker.—P. A. Young.

2045. PELLEGRIN, FRANÇOIS. Bizonula, genre nouveau de Sapindacées d'Afrique occidentale. [Bizonula, a new genus of the Sapindaceae from western Africa.] Bull. Soc. Bot. France 71: 299-300. 1924.—The author describes a new genus, Bizonula, including 1 species, *B. LeTestui*, from the forests of Mayombe. The genus is related to *Macphersonia*.—P. A. Young.

2046. PELLEGRIN, FRANÇOIS. Remarques critiques sur les espèces du genre *Klainedoxa* Pierre. [Critical remarks on the species of the genus *Klainedoxa* Pierre.] Bull. Soc. Bot. France 71: 51-56. 1924.—The author gives a key to the species of the genus and also a list of the species and synonyms.—P. A. Young.

2047. PELLEGRIN, FRANÇOIS. Un genre nouveau africain à affinités brésiliennes. [A new African genus with Brazilian affinities.] Bull. Soc. Bot. France 71: 74-77. 1924.—The author describes *Testulea gabonensis* n. gen. and n. sp. from French Congo. It is related to and in the same family with *Lucembourgia* H. de St. Hil. A discussion is given.—P. A. Young.

2048. POTTIER, JACQUES. Les dimensions cellulaires des feuilles dans le genre "*Timmia*" et leurs variations avec l'altitude. [Dimensions of the cells in leaves in *Timmia*, and their variation with altitude.] Ann. Sci. Nat. Bot. 10<sup>e</sup>. Sér. 5: 321-342. 1923.—Cells of the leaves are found to vary in size and shape with altitude and with approach to arctic conditions. The taxonomic value of this fact is illustrated by the author's belief that these studies show *Timmia elegans* Hagen to be a variety of *Timmia norvegica* Zetterstedt.—Paul Weatherwax.

2049. Преображенский, Г. А. [PREOBRAZHENSKI, G. A.] Contributions à la flore de la région transcaspienne. [Contributions to the flora of the Transcaspien Region.] Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. République Russe] 20: 3-4. 1921.—*Acanthophyllum bracteatum* Boiss. subsp. *elongatum* is described as a new subspecies from Firtisa in the Transcaspien Region.—J. M. Greenman.

2050. SAINT-YVES, A. Festucarum varietates novae (Subg. Eu-Festuca). [New varieties of Festuca (subgenus Eu-Festuca).] Bull. Soc. Bot. France 71: 28-43, 119-135. Fig. 1-8, 9-16. 1924.—The author describes the following new varieties of *Festuca ovina* L., emend. Hack.: *paphlagonica*, *Duwalii*, *dahurica*, *Bungeana*, *Jeanperti*, *australis*, *dolosa*, *cyrnea* St.-Y. & R. Lit., *caucasica*, and *Jaccardii*. Besides these, he described 20 new subvarieties and 13 new subspecies.—P. A. Young.

2051. Пинччинский, Н. В. [SHIPCHINSKI, N. V.] Note sur *Erodium tartaricum* Willd. [Note on *Erodium tartaricum* Willd.] Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. République Russe] 18<sup>2</sup>: 14-16. 1918.—The author records the results of critical observations on this plant and gives an amplified description of the species.—J. M. Greenman.

2052. THELLUNG, A. Über einige kritische *Heracleum*-Sippen der Alpen. [Certain species of *Heracleum* of the Alps.] Oesterreich. Bot. Zeitschr. 73: 200-213. 1 fig. 1924.—The critical study of the genus *Heracleum* by Nevole and Neumayer is supplemented by the writer. The following new names, combinations, and forms are included: *Heracleum Sphondylium* L. f. *glaberrimum*, *H. Moritzianum* and its subvar. *pseudelegans*, *H. montanum* var. *palmatum* (Crantz), *H. Crantzii*, and *H. Pollinianum* Bertol. f. *Facchinii*.—Ernst Artschwager.

2053. Толмалев, А. [TOLMASHEV, A.] Labiatae Riedelianae. [Riedel's Labiatae.] Ботанические Материалы Гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 165-170. 1922.—The Brazilian collections of Riedel contain 6 of the 20 known species of *Eriope*. The author describes 2 new species, namely, *E. silvatica* and *E. tomentosa*. The genesis of the allied genera *Eriope* and *Hypenia* is discussed. The section *Hypenioideae* of the genus *Eriope* is most primitive; the sections *Grassipedes* and *Parvifoliae* present a deviation to the simplification of inflorescence and to the diminution of size; the section *Bothryanthae* presents a deviation in the contrary direction.—Boris Fedchenko.

2054. VERGUIN, COLONEL. De quelques plantes de la Montagne noire des Corbières et des Pyrénées. [Some plantes of the black mountain of the Corbieres and of the Pyrenees.]

Bull. Soc. Bot. France 71: 81-86. 1924.—The author describes the hybrid:  $\times$  *Cistus Neyrauti* (*C. ladaniferus*  $\times$  *monspeliensis*  $\times$  *salviaefolius* Verguin). He discusses *Bunium incrassatum* Lange and *Cerastium fontanum* Baumg.—P. A. Young.

2055. VIGUIER, R., ET H. HUMBERT. *Le Rheedia laka*. [*Rheedia laka*.] Bull. Soc. Linn. Normandie VII, 3: 255-260. 1920 [1921].—Additions to the description of *Rheedia laka* Viguier & Humbert are given, thanks to the new material at hand. Its study has led to the subdivision of the genus *Rheedia* into 2 new sections: *Tetradelpha* with stamens arranged in 4 bundles (*Rheedia laka*) and *Eurheedia* with stamens attached equally all around the ovary (the other species). The authors recall that certain *Rheedias* have 2 little bracts alternating with the sepals and that certain species of *Garcinia* have been described as having the 2 external sepals smaller than the inner ones. One may ask if the floral structure is not the same in the 2 cases and if only the 1 genus *Garcinia* should not be retained.—M. Denis.

### REVISIONS AND MONOGRAPHS

2056. ЧЕРНИАКОВСКА, Е. [CHERNIAKOVSKA, E.] *Revisio Gypsophilarum turkestanicarum e sectione Capituliformes Williams*. [Revision of the Turkestan *Gypsophila* of the section *Capituliformes* Williams.] Ботанические материалы гербария Главного Ботанического Сада Р. С. ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 3: 125-131. 1922.—*Gypsophila Prevbrashenskii*, *G. semiglobosa*, and *G. dshungarica* are described as new.—B. Kozo-Poljanski.

2057. SCHLECHTER, R. *Mitteilungen über europäische und mediterrane Orchideen. II*. [European and Mediterranean orchids. II.] Repert. Spec. Nov. Regni Veg. 16: 257-292. 1919 (Repert. Eur. et Med. 1: 353-388. 1919).—In the present contribution the author considers the genus *Gymnadenia* R. Br. and its immediate allies. Four principal genera are recognized, namely, *Nigritella* L. C. Rich., *Gymnadenia* R. Br., *Leucorchis* Mey., and *Neottianthe* Schltr.; a key is provided for their differentiation. New genera, species, varieties, combinations, and names included are: *Nigritella nigra* (L.) Rehb. var. *pyrenaica*, *N. x Wettsteiniana* (*Gymnadenia x Wettsteiniana* Abel); *Leucotella*, *L. micrantha* (*Nigritella nigra x Leucorchis albida*); *Gymnadenia odoratissima* (L.) A. C. Rich. var. *stenostachya*, *G. conopsea* (L.) R. Br. vars. *caucasica*, *friesica* and *latifolia*, *G. decipiens* (*Platanthera decipiens* Ldl.), *G. Taquetii*, *G. microgymnadenia* (*Habenaria gymnadenia* Kränzl., *G. Delavayi*, *G. himalayica*, *G. Souliei*; *Leucorchis albida* (L.) E. Mey. var. *breviloba*, *L. Frivaldii* (*Gymnadenia Frivaldii* Hampe); *Leucadenia*, *L. Schweinfurthii* (*Gymnadenia x Schweinfurthii* Hegelmeier), *L. Strampfi* (*Gymnadenia x Strampfi* Aschers.); *Neottianthe*, *N. secundiflora* (*Habenaria secundiflora* Hook. f.), *N. pseudodiphylax* (*Gymnadenia pseudodiphylax* Kränzl.), *N. monophylla* (*G. monophylla* Ames & Schltr.), *N. cucullata* (*Orchis cucullata* L.), and *N. camptoceras* (*Habenaria camptoceras* Rolfe).—John E. Dinsmore.

### FLORISTICS AND PLANT DISTRIBUTION

2058. ANONYMOUS. A census of the Victorian flora, with vernacular names. Plant Names Committee of the Field Naturalists' Club of Victoria. (Review.) South Australian Nat. 5: 128-129. 1924.

2059. ANONYMOUS. The grass tree. South Australian Nat. 3: 70-74. 3 fig. 1922.—This offers a popular description of *Xanthorrhoea*.—Wm. Randolph Taylor.

2060. ANONYMOUS. *Vermischte neue Diagnosen*. [Miscellaneous recent diagnoses.] Repert. Spec. Nov. Regni Veg. 16: 62. 1919 (Repert. Eur. et Med. 1: 334. 1919).—Notes are recorded on the following recently published varieties and forms of European plants: *Festuca cyllenica* Boiss. & Heldr. var. *Pauliniana* Belli, *Lychnis flos cuculi* L. nov. lus. *viridiflora* Erdner, *Fumaria Vaillantii* Loisel. var. *umbricola* Erdner, *F. officinalis* L. var. *ericetorum* Erdner, *Arabis hirsuta* Scop. subsp. *euhirsuta* var. *typica* Beck f. *umbrosa* Erdner, *Rubus Menkei* Wh. & N. f. *giganteus* Erdner, and *Eryngium amethystinum* L. var. *majus* Bornm.—John E. Dinsmore.

2061. AUBERT, C. G. Note sur une station ornaise du *Vaccinium Vitis-idaea* L. [Note on a station in Orne for *Vaccinium Vitis-idaea* L.] Bull. Soc. Linn. Normandie VII, 2: 201-204.



1919 [1920].—*Vaccinium Vitis-idaea*, a plant of the mountains, occurs in the forest of Chaumont near Gale (Orne), near a neighboring slope, on only a few square meters.—*M. Denis*.

2062. AUBERT, C. G. Une station de *Veratrum album* en forêt d'Andaines. [A station for *Veratrum album* in the forest of Andaines.] Bull. Soc. Linn. Normandie VII. 4: 129-133. 1921 [1922].—*Veratrum album* L., a plant of the highlands, occurs in the forest of Andaines in Normandy. Its origin should be looked for in the cultivations of the old hermitage of Andaines or even traced back to the glacial period.—*M. Denis*.

2063. BARRE, J. Géographie botanique du département de la Mayenne. [Botanical geography of the department of Mayenne.] Bull. Mayenne Sci. 1921: 700-706. 1921; 1922: 78-89. 1922.—An enumeration is given of the rare species of vascular plants and of the Characeae collected in diverse localities of Mayenne.—*M. Denis*.

2064. BÉDEL, L. Présentation de plantes. [Presentation of plants.] Bull. Soc. Linn. Normandie VII, 3: 156-169. 1920 [1921].—Notes are recorded on the flora of Normandy.—*M. Denis*.

2065. BÉDEL, L. Quelques plantes rencontrées en Normandie et dans la région limitrophe du département de la Seine-et-Oise de 1917 à 1920. [Some plants seen in Normandy and in the neighboring part of the department of Seine-et-Oise from 1917 to 1920.] Bull. Soc. Linn. Normandie VII, 4: 71-78. 1921 [1922].

2066. BERRY, JUNE. A comparative study of the red-seeded and common dandelion. Proc. Iowa Acad. Sci. 29: 313-315. 1922 [Jan. 19, 1924].—Of the dandelions about the campus of Iowa Wesleyan College 85.45% are the common dandelion. This species produces more heads and more seed per head. The 2 species are compared minutely, seed color remaining the most definite distinction.—*H. S. Conard*.

2067. CHEMIN, E. Une nouvelle station de *Lathraea clandestina* L. en Normandie. [A new station for *Lathraea clandestina* L. in Normandy.] Bull. Soc. Linn. Normandie VII, 4: 78-82. 1921 [1922].—This new locality was found at Loges-Marchis (Manche) near the boundary of the departments of Mayenne and of Ille-et-Vilaine.—*M. Denis*.

2068. CHERMEZON, H. Sur quelques Cypéracées africaines critiques. [Some critical African Cypercaeae.] Bull. Soc. Bot. France 71: 141-144. 1924.—Critical notes are given on *Mariscus foliosissimus* Steud., *Fuirena nana* A. Rich., *Chaetospira madagascariensis* Steud., and *Scleria Boivini* Steud.—*P. A. Young*.

2069. CHEVALIER, A. Sur la présence de l'*Obione pedunculata* (L.) Moq. dans la baie du Mont Saint-Michel. [Presence of *Obione pedunculata* (L.) Moq. in the bay of Mont Saint-Michel.] Bull. Soc. Linn. Normandie VII, 4: 110-112. 1921 [1922].—Chevalier has rediscovered *Obione pedunculata* near Pontorson where Poiret found it more than 100 years ago.—*M. Denis*.

2070. CLUTE, WILLARD N. The spring beauties. Amer. Bot. 30: 95-96. 1924.—The author questions the separating of *Claytonia virginica* and *C. caroliniana* as distinct species.—*S. P. Nichols*.

2071. CONARD, H. S. A manual of the gymnosperms ("evergreens") of Iowa, both native and cultivated. Proc. Iowa Acad. Sci. 29: 328-338. 1922 [Jan. 19, 1924].—This is a descriptive key, with habitat, locality, distribution, and notes of general interest, including 25 species of which 4 are native.—*H. S. Conard*.

2072. CONARD, H. S., AND WINIFRED ELLSWORTH. Key to the families of flowering plants of central Iowa. Proc. Iowa Acad. Sci. 28: 305-316. 1921 [April 30, 1923].—An artificial key is given to families of the local flora, providing for ready tracing of dioecious and monoecious species.—*H. S. Conard*.

2073. CRATTY, R. I. Two additions to our list of Cruciferae. Proc. Iowa Acad. Sci. 28: 256-261. Fig. 32-35. 1921 [April 30, 1923].—*Brassica juncea* (L.) Cosson is new to Iowa, and distinguished from *B. arvensis* (L.) Kuntze and *B. nigra* (L.) Koch. *Lepidium perfoliatum* L. has been collected in 2 localities; other occurrences of this species in the U. S. A. are cited.—*H. S. Conard*.

2074. ELLSWORTH, WINIFRED. Parry's catalog of Iowa plants of 1848. Proc. Iowa Acad. Sci. 29: 339-344. 1922 [Jan. 19, 1924].—The author has culled from U. S. Geol. Surv., 1852,

the plants reported by Parry as occurring in Iowa (198 species), mostly with habitat.—*H. S. Conard*.

2075. FOURNIER, P. Un *Carex* à ajouter aux flores de France, *Carex repens* Bell. [*Carex repens* Bell. to add to the flora of France.] Bull. Soc. Bot. France 71: 308-309. 1924.

2076. FRÉMY, P. Excursions de la Société Linnéenne de Normandie dans la région de Saint-Lô. [Excursions of the Linnean Society of Normandy in the region of Saint-Lô.] Bull. Soc. Linn. Normandie VII, 4: 96-108. 1921 [1922].—A list is given of phanerogams, mosses, and algae collected at Meauffe and in the environs of Saint-Lô on excursions of the Linnean Society.—*M. Denis*.

2077. GANDOGER, MICHEL. Le *Malva geraniifolia* Gay nouveau pour la France, et la famille des Malvacées. [*Malva geraniifolia* Gay new in France; the Malvaceae.] Bull. Soc. Bot. France 71: 301-304. 1924.—The author cites the places where he has collected this species in Europe. He also gives a list of the genera of the Malvaceae with their native countries.—*P. A. Young*.

2078. GERBAULT, E. L. Le *Sedum spurium* Bieb. subspontané dans nos limites; ses deux formes. [*Sedum spurium* Bieb. subspontaneous within our boundaries; its two forms.] Bull. Soc. Linn. Normandie VII, 2: 37-39. 1919 [1920].—*Sedum spurium*, native to the Caucasus and southwest Asia, is subspontaneous in Maine and in Basse-Normandie. The author has been able to distinguish 2 forms, namely, *typicum* and *praecox*; these 2 forms correspond to 2 elementary species and constitute a phenotype.—*M. Denis*.

2079. GERBAULT, E. L. Sur les allures de quelques plantes normandes das la péninsule ibérique. [Habits of some Normandy plants in the Iberian peninsula.] Bull. Soc. Linn. Normandie VII, 4: 213. 1921 [1922].—*Oxalis corniculata* L., *O. Acetosella* L., *Umbilicus pendulinus* DC., *Arum maculatum* L. and *Polypodium vulgare* L. are occasionally epiphytes in the Iberian peninsula.—*M. Denis*.

2080. GRESS, ERNEST M. The grasses of Pennsylvania. A manual including keys, descriptions, illustrations and known distribution in the state. Pennsylvania Dept. Agric. [Harrisburg] 7<sup>s</sup>: 1-245. Fig. 1-235. 1924.—The author states that "This publication discusses about 250 species and varieties of grasses, all of which have been reported from the state and with very few exceptions, as noted in the text, are definitely known to have been found in the state." Specimens of almost all of the grasses listed are deposited in the herbaria of the Philadelphia Academy of Science and the Carnegie Museum at Pittsburgh. Ample keys are provided. The species are briefly described, their general distribution is indicated, and their occurrence and habitat in the state are carefully recorded.—*J. M. Greenman*.

2081. HALL, A. J. Excursion from Swan View to Darlington. Jour. and Proc. Roy. Soc. Western Australia 6: 50-52. 1920.—Special plants observed are mentioned and a classified list of 111 is appended.—*Wm. Randolph Taylor*.

2082. ИЛ'ИН, М. М. [IL'IN, M. M.] К Флоре Вятской губернии [The flora of Vyatka Province.] Журнал Русского Ботанического Общества [Jour. Russian Bot. Soc.] 4: 167-168. 1920.—Notes on 10 species of flowering plants are recorded.—*J. M. Greenman*.

2083. ISING, E. H. Botanical Notes. South Australian Nat. 3: 69. 1922.—*Loranthus exocarpi* Behr. is discussed.—*Wm. Randolph Taylor*.

2084. ISING, E. H. Botanical notes. South Australian Nat. 5: 144-145. 1924.—*Eremophila decipiens* Ostenf. is noted for the 1st time from South Australia.—*Wm. Randolph Taylor*.

2085. ISING, E. H. List of native plants growing in the railway reserve at Mile End. South Australian Nat. 5: 111-113. 1924.—There are included 17 species of interest.—*Wm. Randolph Taylor*.

2086. ISING, E. H. The forests of the Mount Lofty range. South Australian Nat. 5: 102-105. 1924.—With general remarks on the territory there is included a classification of the Eucalypts present.—*Wm. Randolph Taylor*.

2087. JEFFERIES, NORMAN. A plea for arbitration. Amer. Bot. 30: 96-99. 1924.—The author questions the possibility of "Blue Dandelions" such as have been reported by R. S. Hoar.—*S. P. Nichols*.

2088. LANSDELL, K. A. Weeds of South Africa. XIII. Jour. Dept. Agric. Union South Africa 8: 383-387. Pl. 1-3. 1924.—A description of *Tagetes minuta* L. is given. As it is an



annual, eradication is effected by means of pulling up and burning all plants before they set seed. The fresh plant yields oil of probably no commercial value, and a dye is obtained from the flowerheads.—*L. I. Goldblatt.*

2089. LENOBLE, F. Découverte du *Juniperus thurifera* L. dans les montagnes du Diois (Drôme). [Discovery of *Juniperus thurifera* L. in the mountains of Diois (Drôme).] Bull. Soc. Bot. France 71: 49–51. 1924.

2090. LETACQ, A. L. Excursions botaniques de la Société Linnéenne de Normandie aux environs d'Alençon et de Fresnay-sur-Sarthe (8, 9 et 10 juin 1919). [Botanical excursions of the Linnean Society of Normandy in the vicinity of Alençon and of Fresnay-sur-Sarthe (June 8, 9 and 10, 1919).] Bull. Soc. Linn. Normandie VII, 2: 117–134. 1919 [1920].—The author gives a list of phanerogams, mosses, and lichens reported in the principal types of stations which were encountered in a trip through the forest of Ecouves and to Fresnay-sur-Sarthe.—*M. Denis.*

2091. LETACQ, A. L. Excursions de la Société Linnéenne de Normandie aux environs d'Argentan (Orne) 4 et 5 juin 1922. [Excursions of the Linnean Society of Normandy to the suburbs of Argentan (Orne) June 4 and 5, 1922.] Bull. Soc. Linn. Normandie VII, 5: 39–60. 1922 [1923].

2092. LYONS, A. B. Conspicuous tropical plants. (Concl.) Amer. Bot. 30: 112–117. 1924.

2093. MAIDEN, J. H. The forest flora of New South Wales. Vol. VIII. Part 7. P. 81–99. Pl. 292–295. Alfred James Kent: Sidney, 1924.—The present number includes descriptions and illustrations of the following plants: *Elaeocarpus Kirtoni* F. v. M., *Eucalyptus aggregata* Deane & Maiden, *Akania Hillii* Hook. f., and *Alectryon coriaceus* Radlk. Attention is called to a limited number of changes in nomenclature relative to names used in previously published parts; and a few miscellaneous notes are also added. This number concludes the 8th and last volume under the above title. About 304 trees have been dealt with in the entire work, representing approximately  $\frac{1}{2}$  of the total number of known indigenous trees of New South Wales.—*J. M. Greenman.*

2094. MALME, GUST. O. A. Beiträge zur Kenntnis der Cerrados-Bäume von Matto-Grosso. I. Leguminosae. [Contributions to the knowledge of the Cerrados-trees in Matto-Grosso. I. Leguminosae.] Arkiv Bot. 18<sup>17</sup>: 1–26. Pl. 1–5. 1923.—Of Cerrados-trees growing on the Brazilian Campos cerrados, that is, campos with the tree-vegetation, at least 200 species are known. The Cerrados-trees are generally but a few meters high, seldom more than 6 m. They have crooked trunks with thick cracked bark, and thin crowns. Most of them are deciduous. Of the Cerrados-trees in Matto Grosso, the greatest number of species belong to the family Leguminosae. Notes are given on the flowering-times of the Cerrados-trees, especially the Leguminosae. An enumeration of arborescent Leguminosae collected in the Cerrados of Matto Grosso, is given with Latin descriptions and notes. The following species are contained: *Pterodon pubescens* Benth., *Dipteryx alata* Vog., *Andira vermifuga* Mart. ap. Benth., *A. cuyabensis* Benth., *A. humilis* Mart. ap. Benth., *Tipuana cinarescens* (*T. macrocarpa* Benth. var. *cinarescens* Benth.) *Machaerium acutifolium* Vog., *M. longifolium* Benth., *M. angustifolium* Vog., *M. amplum* Benth., *M. eriocarpum* Benth., *M. oblongifolium* Vog., *Dalbergia violacea* (*Miscolobium violaceum* Vog.), *Bowdichia virgilioides* HBK., *B. major* (Mart.) Benth., *Ferreirea praecox* (*Tipuana* ? *praecox* Harms), *Sweetia dasycarpa* (Vog.) Benth., *S. elegans* (Vog.) Benth., *Sclerolobium paniculatum* Vog., *S. aureum* (Tul.) Benth., *Diplychandra aurantiaca* Tul., *D. glabra* Benth., *Peltogyne confertiflora* (Hayne) Benth., *Hymenaea stigonocarpa* Mart. ap. Hayne, *Dimorphandra Gardneriana* Tul., *Plathymenia reticulata* Benth., *Stryphnodendron barbatimão* Mart., *S. obovatum* Benth., and *Enterolobium ellipticum* Benth.—*O. Heilborn.*

2095. НЕКРАСОВА, В. Л. [NEKRASSOVA, V. L.] Liste des plantes de la ville Lipesk (gouv. Tambov). [List of plants collected in the City of Lipesk (government of Tambov).] Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. République Russe] 18<sup>2</sup>: 17–26. 1918.—*Equisetum silvaticum* L. and 208 species of flowering plants are included in this list.—*J. M. Greenman.*

2096. НЕКРАСОВА, В. Л. и Л. П. Александров [NEKRASSOVA, V. L., et L. P. ALEXAN-



DROV.] Supplément pour la liste des plantes de la ville Lipezk (gouv. Tambov). [Supplement to the list of plants of the City of Lipezk (government of Tambov).] Известия Главного Ботанического Сада Р. С. ф. С. Р. [Bull. Princip. Jard. Bot. République Russ.] 20: 5-13. 1921.—*Nephrodium Thelypteris* (L.) Desv., 2 species of *Equisetum*, and 152 species of flowering plants supplement the previous list (Bull. Princip. Jard. Bot. République Russe 18<sup>2</sup>: 17-26. 1918) of plants recorded from the City of Lipezk.—*J. M. Greenman*.

2097. PAMMEL, L. H. Shrubs of the McGregor district. Proc. Iowa Acad. Sci. 28: 268-271. 1921 [April 30, 1923].—The author lists 80 species, with localities, as occurring from La Crosse, Wisconsin, through Allamakee and Winneshiek Counties, Iowa.—*H. S. Conard*.

2098. PAMMEL, L. H. Trees of the proposed Mississippi Valley National Park. Proc. Iowa Acad. Sci. 28: 265-267. 1921 [April 30, 1923].—The author lists 63 species by common names followed by Latin names, with localities, as found "within a radius of 30 to 40 miles" of McGregor, Iowa.—*H. S. Conard*.

2099. PERCIVAL, EXLEY. Wild flowers in Georgetown. Jour. Bd. Agric. British Guiana 16: 205-222. 1923; 17: 39-54. 1924.—This report is issued in 2 parts and consists of a description together with the popular and scientific names of the wild flowers in the vicinity of Georgetown, British Guiana.—*J. P. Jones*.

2100. SCHAFFNER, J. H. Additions to the catalog of Ohio vascular plants for 1923. Ohio Jour. Sci. 24: 107-116. 1924.—This is a list of all additions and revisions made in 1923 to the Ohio catalog. The revision of the genus *Carex* was made by K. K. Mackenzie.—*H. D. Hooker, Jr.*

2101. SHIMEK, B. The genus *Ceanothus* L. in Iowa. Proc. Iowa Acad. Sci. 28: 230-242. Pl. 8. 1921 [April 30, 1923].—*C. americanus* L., *C. ovatus* Desf., and *C. ovatus* var. *pubescens* T. & G. are minutely described, with general distribution in Iowa, and habitat. No specimens or localities are cited. A bibliography of 78 titles is added.—*H. S. Conard*.

2102. VIGUIER, R., ET H. HUMBERT. Plantes récoltées à Madagascar en 1912. [Plants collected in Madagascar in 1912.] Bull. Soc. Linn. Normandie VII, 3: 325-356. 1920 [1921]; 4: 37-52. 1921 [1922]; 5: 125-140. 1922 [1923].—This is the 1st part of a systematic report of the plants (more than 2000 numbers) collected during a botanical trip to Madagascar in 1912. A brief itinerary of the Viguier and Humbert expedition is given. The 1st list includes the Cycadaceae (*Cycas*); Podocarpaceae (*Podocarpus*); Ranunculaceae (*Ranunculus*, *Clematis*); Anonaceae (*Hexalobus*); Dilleniaceae (*Hibbertia*); Caryophyllaceae (*Cerastium*, *Stellaria*, *Drymaria*, *Polycarpaea*); Papaveraceae (*Argemone*); Cruciferae (*Cardamine*, *Senebiera*, *Nasturtium*); Sauvagesiaceae (*Sauvagesia*); Connaraceae (*Agelaea*, *Cnestis*); Leguminosae (*Mimosa*, *Leucaena*, *Entada*, *Dichrostachys*, *Cassia*, *Caesalpinia*, *Crotalaria*, *Argyrobolium*, *Lebeckia*, *Indigofera*, *Tephrosia*, *Mundulea*, *Aeschynomene*, *Smithia*, *Stylosanthes*, *Zornia*, *Desmodium*, *Leptodesmia*, *Clitoria*, *Teramnus*, *Bankea*, *Strongylodon*, *Canavalia*, *Phaseolus*, *Vigna*, *Dolichos*, *Prophocarpus*, *Eriosema*, *Cadia*); Compositae (*Ethulia*, *Vernonia*, *Centauroopsis*, *Elephantopus*, *Adenostemma*, *Ageratum*, *Mikania*, *Dichrocephala*, *Rochonia*, *Diplostegium*, *Conyza*, *Nidorella*, *Psiadia*, *Brachylaena*, *Blumea*, *Laggera*, *Pterocaulon*, *Amphidoxa*, *Gnaphalium*, *Syncephalum*, *Catatia*, *Helichrysum*). The genus *Catatia* and many species belonging to the genera named above are new; the diagnoses are given in a memoir by H. Humbert: Les Composées de Madagascar. Mem. Soc. Linn. Normandie 25. 1923 [see Bot. Absts. 14, Entry 987].—*M. Dennis*.

2103. WERKENTHIN, FRED C. Description and key of the genus *Cucurbita*. Proc. Iowa Acad. Sci. 29: 281-290. Fig. 1-3. 1922 [Jan. 19, 1924].—The historical review here given shows a connection between the discovery of America and the appearance of pumpkins and squashes in Europe. Extensive descriptions of *Cucurbita Pepo*, *C. moschata* and *C. maxima* are given, with figures of flower, leaf and stalk of fruit. The principal garden forms are classified.—*H. S. Conard*.

2104. WITTROCK, G. L. *Cuscuta* in Iowa. Proc. Iowa Acad. Sci. 30: 351-354. Fig. 1. 1923 [June 14, 1924].—This is a list of species and citation of specimens in the herbaria of Grinnell College, and Iowa State College, with key to species known or to be expected in this region according to Yuncker's monograph.—*H. S. Conard*.

2105. WITTROCK, G. L. Polygonum in the State of Iowa. Proc. Iowa Acad. Sci. 30:



345-349. 1923 [June 14, 1924].—This is a list of species and citation of specimens in the herbaria of Grinnell College, Iowa State College, and Iowa State University.—*H. S. Conard.*

2106. ZAHN, KARL HERMANN. *Beitrag zur Kenntnis der Hieracien Macedoniens und der Balkanländer.* [Hieracium in Macedonia and the Balkans.] *Repert. Spec. Nov. Regni Veg.* 16: 177-182; 293-300. 1919 (*Repert. Eur. et Med.* 1: 337-342; 389-396. 1919).—Thirty-eight species are listed with many subspecies and varieties, accompanied by localities and in some cases by Latin descriptions. Distinguishing characteristics are often noted. The nomenclature accords with the author's treatment of *Hieracium* for Engler's *Pflanzenreich*.—*John E. Dinsmore.*

## MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

SAM F. TRELEASE, *Editor*

2107. ANONYMOUS. *Conference de Paris.* [Paris Conference.] *Bull. Commission Internat. Exploration Sci. Mer. Méditerranée* 9: 1-14. 1924.—This article contains reports and suggestions from various Mediterranean countries.—*T. C. Frye.*

2108. ANONYMOUS. *Industries and resources of South Africa. A monumental work.* *South African Sugar Jour.* 8: 605. 1924.—In reviewing the 1923-24 handbook to the trades, industries, products, and resources of South Africa and adjacent territories, the author pays high tribute to the work and to its compiler and editor, C. W. FRANCIS HARRISON. Among the many features included are contributions by recognized authorities on maize, cotton, and citrus cultivation, agricultural education, and irrigation.—*Nellie E. Fealy.*

2109. ANONYMOUS. *Joint meeting on the conservation of our native wild flowers.* *Brooklyn Bot. Gard. Rec.* 13: 127-128. 1924.—A report is given of the meeting of May 28, 1924, at the Brooklyn Botanic Garden.—*C. S. Gager.*

2110. CONARD, H. S. *Citation of authors for Latin names.* *Proc. Iowa Acad. Sci.* 30: 355-357. 1923 [1924].—The author objects to citation of authorities except in monographic studies; he advises a statement of the sources used for obtaining the names.—*H. S. Conard.*

2111. GILMORE, KATHRYN. *Methods of modeling the Agaricaceae.* *Proc. Iowa Acad. Sci.* 30: 369-374. 1923 [1924].—The mushroom is sketched in color, and then is imbedded in melted paraffin. When cool the paraffin block is cut open, the mushroom is removed, and a cast is made in plaster of Paris. When this has set, the paraffin is melted off, and the cast is smoothed and painted.—*H. S. Conard.*

2112. GREGORY, HERBERT E. *Report of the Director for 1923.* *Bernice P. Bishop Mus. Bull.* 10: 1-38. 1924.—This report details the activities of the Museum including, among other things, the botanical work, an annotated list of publications issued and in preparation, and reports of the curator of collections and of the librarian.—*Frederick V. Rand.*

2113. KIRSOP, FRANCES MULLIS. *Preliminary study of methods of examining the life of the sea bottom.* *Publ. Puget Sound Biol. Sta.* 3: 129-139. 1922.—Three types of apparatus were compared in effectiveness: Petersen's hard-bottom sampler; a sharp-edged dredge, which scraped the ocean floor; and a Puget Sound rock trawl, whose lower edge was not quite on the ocean floor. The number and kind of animals secured with each per unit of area were recorded. Two of the types of apparatus were used on a tide flat at high tide; at low tide the same general area was tested with a shovel. Thus, in a rough way, the efficiency of the apparatus was tested. Each kind of apparatus was good for particular forms. The rock trawl secured the larger forms; the sampler secured the bottom forms which had little or no locomotion, were not too large and were not deeper than 25 mm.; and the dredge secured those deeper in soft bottom. The most efficient on sandy bottom was the sampler (95%), but on the rock bottom it fell to about 16%. The paper is purely zoological.—*T. C. Frye.*

2114. ROSE, M. *Recherches biologiques sur le plankton.* [Biological researches on Plankton.] *Bull. Inst. Oceanogr. Monaco* 439: 1-16. 1924.—Although devised for copepods, the method is one which may have application to phytoplankton. Narrow test tubes of sea water containing copepods are corked and placed horizontally or vertically in darkened tubes so that parts are dark and parts lighted. After the animals have become adjusted, their distribution is observed. Thus their light reaction is secured in a very simple manner.—*T. C. Frye.*

2115. STANCLIFF, J. O. *The taros of Tahiti and the Marquesas.* *Amer. Bot.* 30: 110-111. 1924.—Notes are given on the edibility of taros (*Colocasia* spp.) and their preparation for food.—*S. P. Nichols.*